

STERLING POWER

Automotive and Marine Power Systems



Market leaders in battery charging technology, on board power and power distribution.



Introducing LiFePO₄ Batteries
ampsystems.co.uk



English Catalogue 2018

Global Distribution List

UNITED KINGDOM:**Marathon Leisure (Marine)**

Teal Building
Northney Marina
Hayling Island
Hampshire
PO11 0NH
Tel +44 2392 637711
Intellitec MV Ltd (Automotive)
Unit 9 Woodway court
Thursby Rd , Bromborough
Wirral, CH62 3PR
Tel 01514828970
Beaconsandlightbars.co.uk
Unit 1, 202 Pershore Road
Birmingham
B30 3EU
+44(0)1214583100
www.beaconsandlightbars.co.uk
Furneaux Riddall & co Ltd
Alchome Plac
Portsmouth
PO3 5PA
+44(0) 2392668621
Bainbridge International Ltd
8 Flanders Park
Hedge End
Southampton
SO30 2FZ
+44(0) 1489776030
www.bainbridgmarine.co.uk
Midland Chandelers
1-5 Century Park
Ballin Road
Nuneaton
Warwickshire
CV10 9GA
Tel +44 2476 394 446
Battery Megastore
5 Kennet Close
Tewkesbury Business Pk
Tewkesbury
Gl20 8TY
Tel: +44 1684 298800
Down Marine Co Ltd
163 Comber Road
Dundonald
Belfast
Co Antrim
Tel +44 2890 480247
RoadPro Ltd
Stephenson Close
Davenport
Northants
NN11 8RF
Tel +44 1327 312233
Wood Auto Supplies LTD
Cromwell Works
Colne Road
Huddersfield
HD1 3ES

AUSTRALIA:**Bainbridge Technologies**

Office & Warehouse
1224 Lytton Road
Hemmant
Qld Australia 4174
Phone: 07 3348 8082
RV Powerstream P/L
Lot 25
Macwood Road
Smiths Lake
NSW 2428
Tel +61 265 544 444

AUSTRIA:**Mörth Marine**

Triesterstr. 150-152
8073 Feldkirchen/Graz
Tel +43 316 293 929

CYPRUS**IMalu Marine**

51 Axiom Court
11 William Wilbur Weir street
6010 Larnaka
Cyprus +35 7993137

DENMARK:**Dacon Europe A/S**

Engshøjvej 19
Gårloese
DK-3660 Stenloese
Denmark
+45 48184 183

EIRE: S IRELAND**Kirwan Technical Services**

Terryglass
Nenagh
Co Tipperary
Tel: +353 672 2136

FRANCE:**Seatronix**

Le Cap, CS 18807
54 Rue du Grand Jardin
35418 Saint Malo Cedex
Tel +33 299 19 69 64
Kent Marine Equipment
3, rue de la dutée
44815 Saint Herblain
France
Tél. : 02 40 92 15 84
Fax : 02 40 92 13 16
Batterie Megastore
350 Rue De L'Odon
14790 Mouen
Caen
Tel: +33 2317 507 97

GERMANY:**Herman Gotthardt GmbH**

Leunastr. 50
22761 Hamburg
Tel +49 4085 1505 0

GIBRALTAR**M. Sheppard's Chandlery**

Waterport
Tel: +350 751 48

GREECE:**Eval SA**

Thesi Tzaverdella - Ano Liosia
133 41
Athens, Greece
T: (+30) 210 5590872 (ext. 205) /
M: (+30) 6942824644 /
F: (+30) 210 5590871
E: george.v@eval.gr / www.eval.gr

FINLAND**Navigreen Oy LTD**

Brontie 3 A 5
02480 Kirkkonummi
+358 40 588 9600

ICELAND**Aukaraf EHF**

Dalbreyku 16
Kopavogur
Is200
Tel +354 585 0000

ISRAEL**Levinson Energy Solutions**

7 Derech Hashalom
Tel Aviv 67892
Tel: 03 6442779
Fax: 03 5423705

ITALY**Kenix Marine S.A.S**

Circonvallazione Trionfale 25
I-00195 Roma
Tel +39 06 39746889

NEW ZEALAND**JB Marine Ltd**

Baffin Street
Opua
Northland
New Zealand
email: service@lowesmarine.co.nz
ph : 09 4028375
mobile : 0274984842

NETHERLANDS**A.S.A.Boot Electro**

De Dollard 1
1454 Atwatergang
Tel +31 204369100
Accu Megastore B.V.
Nieuwe Hemweg 36
Amsterdam
1013CX
+31 (0)206825040
www.accumegastore.nl

NORWAY**Becker, Jörg**

Besøksadresse:
Anundskåsveien 88C N-3675 Notodden
Tel +47 47040200
Seatronix AS
Slalombakken 2
1598 Moss
Tel +47 69250960

SINGAPORE**Dexteritas Pte Ltd**

21, Bukit Batok Crescent
#07-80 WCEGA Tower
658065 Singapore
Tel: +65-96222100
Fax: +65-6570-0693

SWEDEN:**Odelco AB**

Skogsövägen 22
133 33 Saltsjobaden
Sweden
Tel + 46 8 7180300
Watski AB
Kantxegatan 14
SE-200 39 Malmö
Tel.: +46 40 671 67 00
Fax: +46 40 22 05 55
www.watski.com

PHILIPPINES**Filichiban International Forwarding Corp**

5 Branding Iron Street
Rancho Estate II
Marikana City
1800 Philippines
email: fil-ichiban@skyinet.net

PORTUGAL:**Nautel - Sistemas Electronicos, Lda****Rua Fernao Mendes - Portugal**

1400-146 Lisboa
Tel +351 213 007 030

RUSSIA**Fordewind**

Petrovskaya Kosa 7
St. Petersburg 19711
Tel +812 320 1853
Alex Auto Group
Prompshchadka 1, Build 2
Ilyicha str. Noginsk
Moscow region
142402 Russia
+7 9251990605

SLOVENIA**Navtronic D.O.O**

Sercerjeva Ulica 22
Radovljica
4240 Slovenia

SOUTH AFRICA**Power Sol**

Unit S12 Spearhead Buis Pk
CNR Montague Drive
Montague Gardens
Cape Town 7441

SPAIN:**Acastimar**

C/ Ferreries,
21 -23 - P.I. Belianes
43850 Cambrils,
T Spain
+34 977 36 21 18
www.acastimar.com
State Marine Nautica S.L
Carretera Del Mitg 90
Hospitalet
Barcelona
08907
Tel 00 34 93 3360306
Solnautic Sailing SL
C/Jaume Bujosa N°4 - 2º
07198 (Son Ferriol) Palma de
Mallorca
Islas Baleares
Email: info@solnautic.com
Tel. (+34) 653 94 93 99

SWITZERLAND:**X-P Edition**

Meggenhus 458
9402 Morschwil
Tel +41 79457 44 84
Dolphin Marina Supply
Unterdorfstr. 16
8595 Altnau
Switzerland
+41 716900970

SWEDEN**Ellbe Truck Interior - com. veh.**

Verkstadsgatan 3
SE-856 33 Sundsvall
+46 601 760 40

TURKEY**Trend Marin**

Cevizli Mah. Toros cad.
No: 21/1
Maltepe, Istanbul
Tel + 90 0 216 371 15 55
+ 90 0 542 760 90 48
www.trendmarin.com
Email : info@trendmarin.com
oktay@trendmarin.com

NORTH AMERICA**UNITED STATES****Sterling Power USA**

406 Herald L. Dow Hwy.
Eliot, ME. 03903
USA
Phone: 207-226-3500
Fax: 207-226-3449
info@sterling-power-usa.com

Defender Marine

www.defender.com
42 Great Neck Road, Waterford,
CT
(860) 701-3400

Bay Marine Supply

3235 Hancock St # 12
San Diego, CA 92110
(619) 320-5899
www.baymarinesupply.com

Midwest Marine Supplies

www.midwestmarinesupply.com
24300 Jefferson Avenue,
St. Clair Shores, MI 48080
(586) 778-8950

ARC Battery

80 Gate 5 Rd, Sausalito, CA
94965, United States
+1 415-332-3272

Stay / Side Systems

521 Central Dr #201
Virginia Beach, VA 23454
Phone: 757-463-1561

Get Feet Wet Navigation, INC

885 Patriot Dr
Moorpark, CA 93021
United States

Cruise RO Water

2448 Carroll Lane,
Escondido, CA
92027 USA
619-609-3432

Island Water World Off Shore

1 Wellsburg Road
Cole Bay
St. Maarten
Tel +39 06 39746889

Mathiesen Marine Services

3300 Powell St, Emeryville,
CA 94608,
United States
510 428 1690

Odyssey Southeast

223 S.W. 33rd Street
Ft. Lauderdale,
FL 33315
(954) 766-2570

Brooklin Boat Yard

44 Center Harbor Rd,
Brooklin,
ME 04616

C TECH Marine Electric

671 10th Street
Blaine, WA 98230
Phone: 360.739.4121

CANADA**Compass Marine Services**

1050 W Pender St,
Vancouver,
BC V6E 3S7,
Canada

Ontario Battery Services

304 Carlingview Dr,
Etobicoke,
ON M9W 5G1,
Canada

JM Bastille

396 Rue Témiscouata,
Riviere-Du-Loup,
QC G5R 2Z2,
Canada

Les Industries Halrai

340 Rue Marie Curie,
Vaureuil-Dorion,
QC J7V 5V5,
Canada
+1 450-455-8884

Page

- 2 International Distributor List
- 3 Contents Page

Battery Chargers (AC - DC)

- 4 The Ultimate Battery Charger - **Pro Charge Ultra I**
- 5 The Ultimate Battery Charger - **Pro Charge Ultra II**
- 6 Budget Compact Charger - **Pro Charge Ultra LITE**
- 7 Portable 7A Charger - **Ultra Portable**
- 8 Range of Portable Charger - **1A - 6A**
- 9 Hand Held Universal Charger - **Global Smart Charger**
- 10 Battery Chemistry Module (**BCM**) I
- 11 Battery Chemistry Module (**BCM**) II

Waterproof Battery Chargers (AC-DC)

- 12 10A-40A, 12V-48V | 1-4 out - **Pro Charge Ultra Aquanautic I**
- 13 10A-40A, 12V-48V | 1-4 out - **Pro Charge Ultra Aquanautic II**
- 14 Other Chargers - **Pro Sport Series 1A - 20A**

Regenerative Braking / Euro 6 problem

- 15 Regenerative / Smart Alternators Explained - **MUST READ**

WILDSIDE - Caravan Charging please read

- 16 Caravan charging - on-board caravan charging issues.
- 17 Wildside - **Caravan charger BBC1225**

Campervan Power Panel

- 18 Campervan Power Distribution Panel - **PDP I**
- 19 Campervan Power Distribution Panel - **PDP II**

Battery to Battery Chargers (DC-DC)

- 20 20A- 60A Battery to Battery Charger - **Pro Batt Ultra**
- 21 60A-120A waterproof + Alternator Linearisation Device - **ALD**
- 22 120A-240A Very High Powered Batt to Batt Chargers - **VHPs**
- 23 12V-48V Waterproof / up to 30A - **Pro Charge B**

Lithium Batteries - ampsystems.co.uk

- 24 100Ah | 120Ah 12V Lithium batteries
- 25 Lithium batteries information

Alternator Regulators

- 26 Advanced Alternator Regulators - **I**
- 27 Advanced Alternator Regulators - **II**

Alternator to Battery Chargers

- 28 Alternator to Battery Chargers - **I**
- 29 Alternator to Battery Chargers - **II**

Splitting Systems

- 30 0.0V Drop Alternator Splitting System **Pro Split R I**
- 31 0.0V Drop Alternator Splitting System **Pro Split R II**
- 32 Current Limiting Voltage Sensitive Relays
- 33 Voltage Sensitive and Ignition Fed Relays
- 34 Latching Relays - **Pro Latch R I**
- 35 Latching Relays - **Pro Latch R II**
- 36 Electrical Latching Battery Isolation Switches (**ELBs**)
- 37 Split Charge Diodes & DC Isolation Switches

Inverters / Combis

- 38 **1600VA Combi S+** and original **2500W - 3500W Combi S**
- 39 **3200 - 5000VA Pro Combi S2** New to 2017
- 40 Quasi / Modified Sine Wave Inverters **Pro Power Q**
- 41 Pure Sine Wave Inverter **Pro Power S (SIBs)**

AC Crossover Switches

- 42 AC Automatic and Manual Crossover Switches

Monitors and Gauges

- 43 High Voltage Protection Device
- 44 Power Management Panel **PMP1**
- 45 Portable Meters
- 46 Voltage and Temperature Monitoring w/ alarm
- 47 Pneumatic Tank Gauge System

Zinc Savers / Galvanic Isolators

- 48 Zinc Savers / Galvanic Isolators **Pro Save I**
- 49 Zinc Savers / Galvanic Isolators **Pro Safe II**

Battery Maintainer

- 50 Battery Maintainer / trickle echo charger

Fuses / Holders / DC Distribution

- 51 500A Fuse and Cable Distribution Box
- 52 Gold Plated Fuse Holders
- 53 Gold Plated Fuses and Accessories

DC Jump Starter and Charging Device

- 54 Jump Start DC/DC Charging Device **I**
- 55 Jump Start DC/DC Charging Device **II**

Miscellaneous Products

- 56 Alternators & Alternator Protection Device
- 57 Battery Desulphation + maintenance **Pro Pulse**
- 58 Daisy Chain

Perusals

- 59 FAQ - **I**
- 60 FAQ - **II** - **Regenerative Braking**
- 61 FAQ - **III**
- 62 FAQ - **IV** - **4 Stage Charging Explained**
- 63 Cable Sizes / Lengths (**Table**)



For HD photographs of Sterling's products, refer to:
<https://www.flickr.com/photos/128075788@N06/sets/>
 The relevant links can also be found on our website.

Brief warranty statement and Sterling Power's UK location



2 years return to factory warranty. Sterling shall endeavour to replace the product or repair it within 5 working days of it being returned. Sterling is not liable for return carriage or additional labour. Lifetime repair policy after 2 years - If it is uneconomical to repair the product then a special discount may be offered on a similar product at Sterling's discretion. This only occurs if dealt with Sterling directly.

Pro Charge Ultra

Award Winning Global Digital Battery Chargers

Winner of numerous awards



One of the world's most efficient chargers. This is courtesy of **active power factor correction** (PFC 0.99-1). The Pro Charge Ultra is rated at over 90% efficient. PFC is an extremely important feature please refer to **Page 59**. Non-active PFC chargers are approximately 65% efficient.

Truly Global Application and perfect for generators. The Pro Charge Ultra shall work at **AC voltages (80-270VAC and 40-70Hz)** and **DC voltages (130-320V)**.

UL 1236 SB listed, the highest build standard.
California Energy Commission CEC.

Comprehensive 32 LED front panel. The user is provided with a **voltmeter, ammeter and output power display**. The panel also includes charging profile statuses and warning statuses.

Multi Lingual. The Pro Charge Ultra now comes with **front labels, Remote control and instructions in different languages:** English, French, German and Spanish.

11 pre-programmed charging profiles for AGM, Gel, sealed/flooded, calcium and lithium (LiFePO₄) batteries. We also include a **customizable** option to allow the user to programme their own profile via the front panel.

Models:

12V / 10-60A

24V / 20-30A

36V / 20A

48V / 15A

Remote Control shall operate all models.

5 year warranty.

From 1st January 2016 all PCUs have a market leading 5 year warranty.

World's Best Seller

This charger's design is the charger of choice by the world's largest production boat builders. It is fitted to more new boats than any other charger in the world.

Power Pack / Power Supply.

This charger works effortlessly as a power supply to DC loads to prevent depletion of your battery capacity.

Battery Temperature compensation sensor included.

Automatic Desulphation mode: 7-10 days cycle with anti-stratification program to keep batteries rejuvenated.

Perfect for generator use. Due to its active PFC tolerance of AC input it shall run from crude sine wave forms - typical from generators. **Also, % Power Reduction** you can set the charger to run at lower power outputs to complement a wider range of generators and low shore power connections.



STANDARDS AND ADVANCED SPECIFICATIONS



ABYC

RoHS compliant



UL 1236 SB

CEC listed

CSA C22.2-107.2

Tested to CE standards

EN61000-3-2

EN61000-3-3

EN55014-1

EN 55014-2

EN60335-2-29

EN ISO 13297

EN 6100-3-2 Class A

12V / 60A model, all other units pro rata

Input voltage range 80-270V 40-70 Hz

Power Factor at 230V 0.976

Efficiency 90.4%

Full load current (110/230V) 9.8/4.6A

Total Harmonic Distortion 2.4% voltage

Total Harmonic Distortion 2.4% current

Ripple noise (R.M.S.) 14mV

Ground leakage 0.5 mA

Generator/ mains power (watts)

12V 20A approx 400W

12V 30A approx 500W

12V 40A approx 700W

12V 50A approx 850W

12V 60A approx 1000W

24V 20A approx 700W

24V 30A approx 1000W

voltmeter accuracy +/- 1%

Ammeter accuracy +/- 1%



Up to 3 isolated outputs. Each output can carry the full current rating of the charger. However, not all simultaneously - the total current is the charger's rating.

Cables not included with charger.
Refer to page 46 for cables.

Additional Specification

– **USA California Energy Commission (CEC) listed:** CEC regulation stipulates that the charger is only on when necessary. This reduces AC power consumption and lowers operational costs while maintaining healthy batteries. (default setting is on, CEC can be turned off)

– **Synchronized Rectification:** Mosfet technology, increases overall efficiency over diode based chargers by approximately 8 percentage points.

– **Automatic Desulphation / Equalization mode:** 7-10 days cycle with anti-stratification program to keep batteries rejuvenated.

– **Voltage + Current LED display:** 2 LED matrix displays. Left side is the voltmeter and the right side is the ammeter.

– **Performance monitoring LED bar:** An LED display to show what rate the charger is operating at.

– **Redundant safety system:** In event of failure, the processor provides another system to shut off device, doubling security. The primary emergency backup is digital, the secondary system is analogue both are totally independent of one other.

– **High temperature ambient operation rating:** Most chargers are only continuously rated at 20 deg C (if even) this unit is rated at continuous operation at 40 deg C ambient.

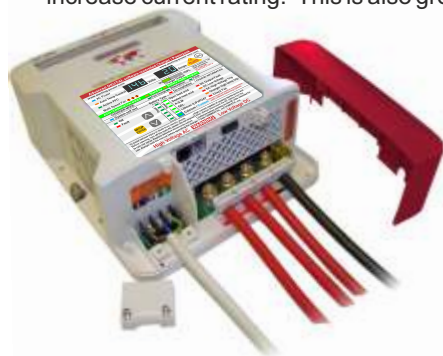
– **Multiple speed fan control:** This reduces unnecessary fan noise experienced by the customer, even though the new extreme efficiency reduces the need for fans. At high ambient temperatures (40-50 deg C), however, fans would still be required to ensure operation.

– **Thermostatically controlled force draft cooling:** To ensure that when the cooling is actually required the noise level is as low as possible for the environmental and power conditions.

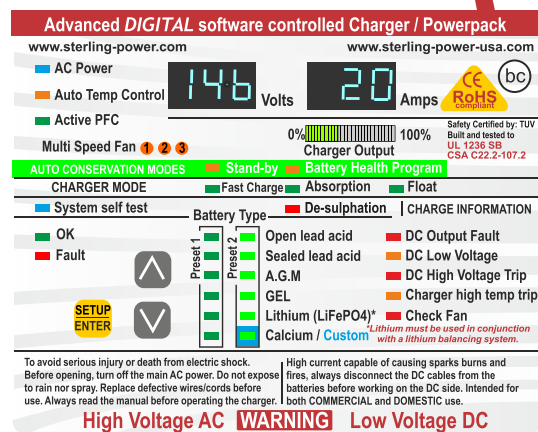
– **The printed circuit boards are conformal coated:** For high humidity and salt air operations.

– **% power reduction:** To allow unit to work with restricted power available (available on local control or remote control panel).

– **Multiple chargers:** Multiple chargers can be put in parallel to increase current rating. This is also great for redundancy.



Basic wired setup
cables not included
photo courtesy of MDSbattery.co.uk



32 LED display. The front panel provides information regarding:

- Voltmeter
- Ammeter
- Charger output display bar
- Charging statuses
- Battery chemistry select,
- Temperatures
- Voltage warnings.
- Multi Lingual overlay labels available.

Optional Remote Control

- Charging voltage (V) and open charge current (A)
- Multi lingual - English, Spanish, French, German and Italian.
- Charging stage and duration
- Configured Battery Type
- Temperature of the charger
- Temperature of the battery
- Error Messages
- 110 x 68 x 20 mm
- 5 meters of cabling
- Remote housing - surface / recess / flush mounted



Pro Charge Ultra

DC (V)	Rating (A)	Weight (KG)	L x W x D mm	Code
12V	10A	2	260 x 215 x 90	PCU1210
12V	20A	2	260 x 215 x 90	PCU1220
12V	30A	2	260 x 215 x 90	PCU1230
12V	40A	2	260 x 215 x 90	PCU1240
12V	50A	3	315 x 215 x 90	PCU1250
12V	60A	3	315 x 215 x 90	PCU1260
24V	20A	2	260 x 215 x 90	PCU2420
24V	30A	3	315 x 215 x 90	PCU2430
36V *	20A	3	315 x 215 x 90	PCU3620*
48V *	15A	3	315 x 215 x 90	PCU4815*
Remote w / 5m cable		0.05	110 x 68 x 20	PCUR



German main label overlay sticker

French main label overlay sticker

Spanish main label overlay sticker

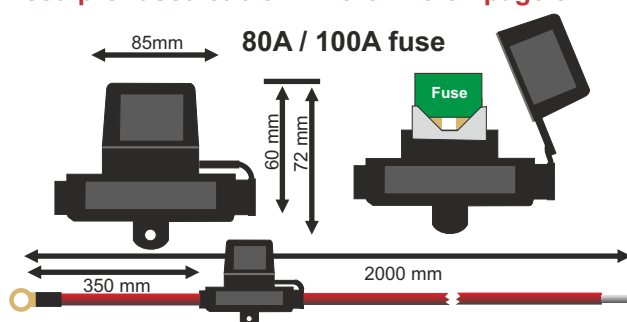
* Built to UL1236 and CEC but not listed
Multi language main label overlay sticker

PCUG

PCUF

PCUS

Need pre-fused cable? - more info on page 57



Code	Description
FRAWG8	AWG8 (8mm ²) Fused (80A) Wired (2m), RED
FBAWG8	AWG8 (8mm ²) Fused (80A) Wired (2m), Black
FRAWG6	AWG6 (14mm ²) Fused (100A) Wired (2m), RED
FBAWG6	AWG6 (14mm ²) Fused (100A) Wired (2m), Black



Battery Chemistry Module

Mixing battery types or voltages

You may have multiple battery types in your DC system (e.g. AGM + open lead acid + Gel) and / or different voltages (12V and 24V) - Please look at our range of **Battery Chemistry Modules (BCM)**. The BCM is designed to simply be added to the output of the PCU to charge different battery type at different voltages. PLEASE TURN TO **PAGE 10**.

Pro Charge Ultra Lite

Multi stage | Fully Active PFC | Custom Charge Selection | 12V 20A / 30A | 2 outputs

Global Voltage 80-270VAC 40-70 Hz

(minor power reduction when AC voltage drops below 100V)

This new **Pro charge Ultra Lite** is aimed at the budget sensitive market. A common question shall be, what are the key differences between the **Ultra** and the **Ultra Lite**?:

- 1) The **Ultra** is larger due to it meeting the ABYC 40 Deg C+ high ambient temperature performance standards.
- 2) The **Lite** has an operational range in the 20 Deg C+ (a more common standard for non ABYC), thus, in a smaller body.
- 3) The **Lite** displays less information on the front panel but still a lot more than its competitors .
- 4) Although built to UL standards, including fire resistant plastics etc, the **Lite** is NOT UL certified.
- 5) The **Lite** is not CEC certified, the **Ultra** is.
- 6) The **Lite** has temperature compensation, however, unlike the **Ultra**, the sensor is optional.
- 7) Cost, the **Lite** is lower cost
- 8) Outputs: The **Lite** has a max of 2 outputs suitable for most operations the **Ultra** has 3.
- 9) PCU Lite has 2 years warranty the **Ultra** has 5 years.

230VAC performance is 30A DC | 20A DC
110VAC performance is 27A DC | 20A DC
 unit temperature dependent.

Truly Global Application and perfect for generators. The **Pro Charge Ultra Lite** shall work at **AC voltages (80-270VAC and 40-70Hz)** and **DC voltages (130-320V)**.

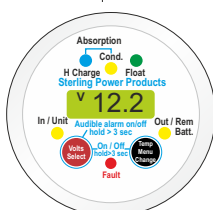
Comprehensive 18 LED front panel. The dual function nature of the LED panel shall also provide voltage information, charging profile statuses and warning statuses.

Battery temperature sensing compensation and remote control (optional). Unlike our competitors this unit has battery temperature sensing and remote control port. The sensor and remote are optional extras. Temp sensor below (TSAY).

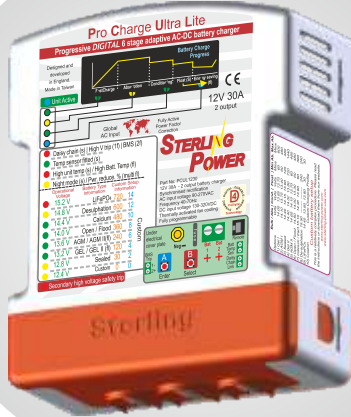
Battery daisy chain multiple battery high temperature system shutdown (optional) . Where large numbers of batteries are being used our digital temperature sensor can be linked in a chain to shutdown the battery charger in event of any battery's exceeding 50 deg C.

8 pre-programmed charging profiles for AGM, Gel, sealed / flooded, calcium and lithium (LiFePO4) batteries. We also include a **fully customizable** option to allow the user to programme their own profile via the front panel.

Night time setting allows the unit to run at 1/2 power for a fixed time frame so the fan noise is reduced to a minimum.



Input voltage range	80-270V	40-70 Hz
Power Factor at 230V	0.976	
Efficiency	94.4%	
Total Harmonic Distortion	2.4% voltage	
Total Harmonic Distortion	2.4% current	
Ripple noise (rms)	14mV	
Ground leakage	0.5 mA	
Generator / mains power (watts)		
12V 30A approx	500W	
12V 20A approx	350W	
voltmeter accuracy	+/- 1%	



Larger voltage / current requirements?
 The Pro Charge Ultra Lite series can be put in series or parallel with other Pro Charge Ultras. This is possible due to the chargers digital dynamic charging ability.

Float Modes and Energy Saving Modes.

You can force this charger into float mode (mid ~13V) intermittently or indefinitely. You can also put the charger into an Energy Saving mode. This mode saves energy by dropping the output voltage down to the voltage of a full battery (~12.8V). This ensures the battery is full and that the charger acts as a power supply when a load is applied to the battery.

Remote Control (Optional) LPCUR

Displays: Voltage / Warnings / Temperatures
 Can be used as an independent voltmeter measuring input battery voltage and output battery voltage.
 - Force the unit to 1/2 current limit.
 - Reset both remote and charger.
 - 54mm diameter.



Optional Temp Sensor (TSAY)



Optional Daisy Chain (TSD50/60)

One of the world's most efficient chargers. This is courtesy of **active power factor correction** (PFC 0.99-1). and synchronised rectification The **Pro Charge Ultra Lite** is rated at over 90% efficient. PFC is an extremely important feature, please refer to **Page 59**. Non-active PFC chargers are approximately 65% efficient.

Power Pack / Power Supply.

This charger works effortlessly as a power supply to DC loads to prevent depletion of your battery capacity.

Automatic Desulphation mode:

7-10 days cycle with anti-stratification program to keep batteries rejuvenated.

1/2 current mode. Reduce the charger's current by 50%.

Perfect for generator use. Due to its active PFC tolerance of AC input it shall run from crude sine wave forms - typical from generators.

Power Reduction you can set the charger to run at lower power outputs to complement a wider range of generators and low shore power connections.

Standards

Tested to CE standards
 EN61000-3-2
 EN61000-3-3
 EN55014-1
 EN 55014-2
 EN60335-2-29
 EN ISO 13297
 EN 6100-3-2 Class

Outputs	DC (V)	Rating (A)	Weight (Kg)	L x W x D mm	Code
1	12V	20A	2.2	198 x 158 x 70	LPCU12201
2	12V	20A	2.4	198 x 158 x 70	LPCU12202
2	12V	30A	2.5	198 x 158 x 70	LPCU1230
Remote w / 10m cable			0.05	54mm diameter	LPCUR
Battery Temp sensor analogue					TSAY
50 Deg C = 122 Deg F Digital Temp Sensor DAISY CHAIN					TSD50
60 Deg C = 140 Deg F Digital Temp Sensor DAISY CHAIN					TSD60

Ultra Portable 7A

Multi stage | Multi Chemistry | Adjustable current | 12V and 6V operation

7A Ultra Portable

Sterling has now integrated its high end algorithms for each battery type into a small and portable charger. With the Ultra Portable you get the same great performance from a portable charger as you would with a fixed charger. You can select between 6 different battery chemistries, between 6V and 12V and between 3A | 5A | 7A charging rate. The portable charger can be wall mounted thanks to the wall bracket on the back of the charger.

Multi battery chemistry selection.

Similar chargers only have one battery charging profile which fits all. This new portable charger has 6 preset charging profile (see table below) for each battery type, ensuring a fast and safe charging rate.

Automatic or manual start up. Charger shall start charging automatically after 30 seconds. This is in case you have cut the power or have had a power cut and the charger shall resume charging and maintaining the batteries.

The charger shall also remember which charging profile and current rating you have set and shall automatically resort to this setting when you turn the power on.

Multi information LCD screen for maximum information including:

Nominal charging voltage (6V / 12V).
Real charging voltage.
Charging current.
Battery chemistry select.
Fault information.

6 stage battery charging.
View graph below.

UK + Europe + USA
plug models available

12V and 6V operation.
The charger senses which voltage the batteries are at and adjust the charging profiles accordingly.

6 Stage Charging Curve -
Charger set to Number 2 (14.4V bulk and 13.8V float). The charger shall pick up if a load is applied to the battery and re-establish boost mode.

4 Faults on display.

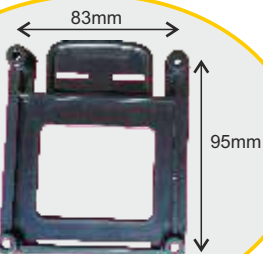
Fault 1 = High output voltage
Fault 2 = High unit temp alarm
Fault 3 = Reverse Polarity
Fault 4 = Open circuit / Batt disconnected

Power reduction capability:

The unit can be set to 3A | 5A | 7A

Can bring 12V batteries that have gone down as low as 4V back up to 12V.

Attractive packaging box,
ideal for retail.

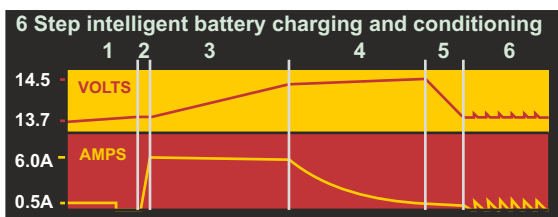


Wall mounting storage bracket (included) on reverse side of the charger. Quick release for portable operation. Measurements denote centre of hole to hole.

Chemistry Charging Profiles

	Number	1	2 (default)	3	4	5	6*
	Profile	Gel I / AGM I	Sealed LA / Lithium	AGM II	Open LA	Calcium	Desulph
12V	Absorption (V)	14.1	14.4	14.6	14.8	15.1	15.5
	Float (V)	13.4	13.8	13.7	13.3	13.6	N/A
	Number	1	2 (default)	3	4	5	6*
	Profile	Gel I / AGM I	Sealed LA / Lithium	AGM II	Open LA	Calcium	Desulph
6V	Absorption (V)	7.1	7.2	7.3	7.4	7.6	7.8
	Float (V)	6.7	6.9	6.9	6.7	6.8	N/A

Input voltage range 190-250V 50 Hz
Power Factor at 230V 0.90
AC current at 230V ~0.6A
Efficiency ~80%
Total Harmonic Distortion 2.4% voltage
Total Harmonic Distortion 2.4% current
Ripple noise (R.M.S.) 14mV
Ground leakage 0.5 mA
voltmeter accuracy +/- 1%



Ultra Portable 6V / 12V | 7A charger

Region	V DC	L x W x D (mm)	Weight Kg	Code
British	6V 12V	190 x 115 x 70	0.5	B127
Europe	6V 12V	190 x 115 x 70	0.5	E127
USA	6V 12V	190 x 115 x 70	0.5	A127

Portable Battery Chargers (1A-6A)

Schuko



Each model is available in **Euro** (Schuko) or **British** socket, simply select **E** or **B** in the SKU

British



6A
6V & 12V



5A
6V & 12V

Portable micro processor controlled chargers 230V AC 50Hz only

Voltage(V)	Current (A)	Plug	L x W x D mm	Weight Kg	Code
6V & 12V	6A	British	180 x 100 x 55	0.7	B126
6V & 12V	6A	Euro	180 x 100 x 55	0.62	E126

Portable micro processor controlled chargers 230V AC 50Hz only

Voltage(V)	Current (A)	Plug	L x W x D mm	Weight Kg	Code
6V & 12V	5A	British	180 x 100 x 55	0.62	B125
6V & 12V	5A	Euro	180 x 100 x 55	0.62	E125



3A
6V & 12V



4A
6V & 12V

Portable micro processor controlled chargers 230V AC 50Hz only

Voltage(V)	Current (A)	Plug	L x W x D mm	Weight Kg	Code
6V & 12V	3A	British	170 x 110 x 55	0.45	B123
6V & 12V	3A	Euro	170 x 110 x 55	0.45	E123

Portable micro processor controlled chargers 230V AC 50Hz only

Voltage(V)	Current (A)	Plug	L x W x D mm	Weight Kg	Code
6V & 12V	4A	British	160 x 60 x 45	0.6	B124
6V & 12V	4A	Euro	160 x 60 x 45	0.6	E124



1A
12V

Float mode only
(1A charger)

Portable Battery Chargers

	1A	3A	4A	5A	6A
LED display, indicates charging status and faults.	●	●	●	●	●
Fault diagnostic system.	●	●	●	●	●
Over heat / short-circuit / reverse polarity protection.	●	●	●	●	●
Low input voltage and over voltage protection.	●	●	●	●	●
Suitable for use with long term float / storage of battery.	●	●	●	●	●
Constant 13.9V charge.	●	●			
Automatic 4 stage charging profiles.			●	●	●
Adjustable charging current rates.		●	●	●	●
Battery rejuvenation, pulse function (de-sulphation cycle).		●	●	●	●
Insulated charging clips.	●	●	●	●	●
Suitable for outdoor use in dry conditions only.		●	●	●	●
Battery Ah capacity rating, up to 120Ah:	●	●	●	●	●
Choice of either British or European plugs	●	●	●	●	●
Auto start up	●				
6V (and 12V charging) battery charging options		●		●	●

Portable slow charge battery maintainer 230V AC 50 Hz only

Voltage(V)	Current (A)	Plug	L x W x D mm	Weight Kg	Code
12V	1A	British	135 x 50 x 40	0.35	B121
12V	1A	Euro	135 x 50 x 40	0.35	E121

Portable Global Smart Charger

12V-5A / 24V-2.5A

Battery chemistry selection - worldwide voltage operation

Universal AC Input (100V to 240V 47Hz-64Hz): can be used anywhere in the world, truly global charging.

50% power reduction mode: For small batteries, under 30Ah.

Battery chemistry selection. Suitable for all types of lead acid batteries: Wet, GEL, AGM, Calcium.

Three charge modes. When the battery is found to be suitable for a charge then the charger will bulk charge, then pulse width absorption charge and finally float charge, the unit can then be left on permanently.

Defective battery identification. The charger detects if the battery is beyond repair.

Desulphation / Equalization mode. The Global Smart shall attempt to pulse the sulphate plates to clean them. Repairs can only happen if recoverable.



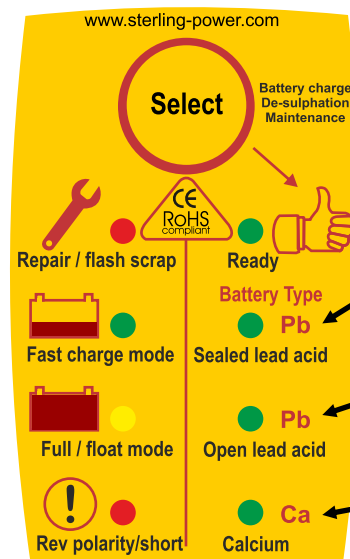
Simple 3 touch screen selections with intuitive iconic LED indications.

Pulse absorption and float charge. After battery is charged the charger can still provide 5A to run on board lighting / appliances. Works as a small power supply.

Soft start charging. If the battery is found to be heavily depleted then the smart charger will start at a low pulse current until the battery has reached a level where it can then absorb the full charge power.

Polycarbonate casting.

Water resistant **IP45 waterproof.**



Easy to select battery type voltages x 2 for 24V unit.

Sealed lead acid
Gel and AGM
Max 14.4V charge
Float 13.5V

Open lead acid
14.8V charge
Float 13.5V

Calcium
15.1V charge
Float 13.5V

Protections:

- Overload protection
- Short circuit
- Over temperature
- Reverse polarity
- Thermal Control - regulates in hot conditions
- 50% power reduction for batteries under 30Ah
- Cold weather charging - higher voltage charge.
- No Connection Spark - charger only on when connected

Approvals: EN60335 EN55014

Global Smart portable battery charger

Plug type	Input (VAC)	Output (VDC)	Current (A)	Weight Kg	Code
British	110-230V	12V	5A	0.4	GS125B
Euro	110-230V	12V	5A	0.4	GS125E
USA	110-230V	12V	5A	0.4	GS125A
British	110-230V	24V	2.5A	0.4	GS243B
Euro	110-230V	24V	2.5A	0.4	GS243E
USA	110-230V	24V	2.5A	0.4	GS243A

Battery Chemistry Module

Multi Chemistry Multi Output charging device

12V/60A 24V/30A

The Battery Chemistry Module (BCM) is a retro fit device designed to be installed on the output of a current limiting multi output battery charger to allow the battery charger to have independent chemistry selection on each output. More and more so, individuals are having different battery styles/chemistry and different voltage scales (12V and/or 24V) all within their DC system. Due to this quagmire, the BCM is the solution to allow one battery charger to charge different battery chemistries at different voltage scales and at their correct charging profile. So, the BCM can essentially turn a very simple battery charger into a multi output, multi chemistry advanced battery charger with other inherent advantages.



Most cost effective method for multi chemistry multi output battery charging on the market.

Simple to install. Simply connect the input of the BCM to an output of a current limiting battery charger and connect the output of the BCM to the battery bank.

Converts a single output charger into a multi output charger using multiple units.

Converts a multi output charger into a multi chemistry multi output charger.

Ideal set up would be a 12V AGM house bank and a 24V deep cycle bow thruster bank. From one charger you can charge both banks at their correct voltage scale and correct charging profile.

4 Models:

12V - 12V
12V - 24V
24V - 24V
12V - 24V

8 selectable charging profiles.

AGM, Gel, sealed lead acid, flooded lead acid and lithium. There is also a desulphation mode.

Remote voltage compensation. To do away with voltage drop across long cables there is a feature which allows the charger to compensate for a voltage drop up to about 1 volt.

Do not install on a charger where the current exceeds the BCM's rating.

Battery temperature compensation and high battery temperature trip.



Battery Chemistry Module or a Battery to Battery Charger?

We are frequently asked this question.

For an in depth reason to choose the BCM over the **Battery to Battery Charger**. We recommend that you refer to our FAQ page. Here we shall discuss the main differences, essentially the benefits of current limiting in the versatility of the battery to battery charger. The BCM is a more cost effective method when connected to a battery charger.



Temperature Sensor
1 x battery analogue temperature sensor



Optional Remote Control
cut hole: 54 mm
total diameter: 68 mm
thread depth: 44 mm

Additional Specifications:

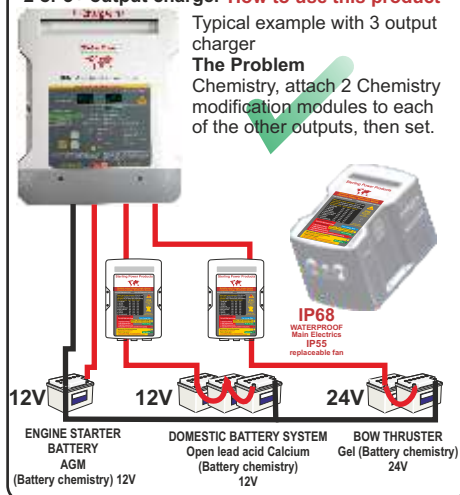
- 1) 6 LEDs projecting over 20 individual charge and warning information events.
- 2) Fail safe, reverts to basic charge function - about 1V less in event of a failure. Product can be replaced/repared at convenience.
- 3) High battery temperature "daisy chain" trip (optional). Every battery can be monitored and the unit switched off. This can be done in the event of a battery overheating - causing high battery temperature problem.
- 4) Ignition fed generator to link in with sterling Pro Split R alternator splitter, this allows the output to be further split.

A common problem that the BCM solves.

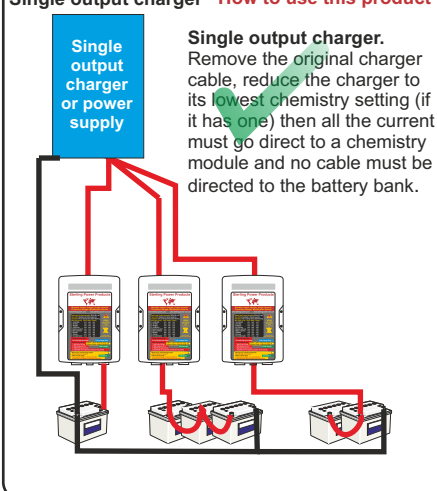
Typically people have a mix of battery types in their system. A 12V AGM house bank and a flooded 24V bank for the bow thrusters. These batteries ideally want to be charged at different profiles. With a conventional charger this is not possible as you are fixed to 12V at an AGM setting. The BCM allows the user to charge at a flooded lead acid profile at 24V, while maintaining the charging profile for the starting battery at 12V. There are numerous combinations.

Typical Wiring Examples

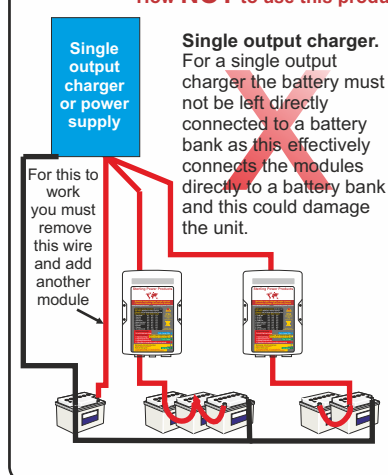
2 or 3+ output charger How to use this product



Single output charger How to use this product

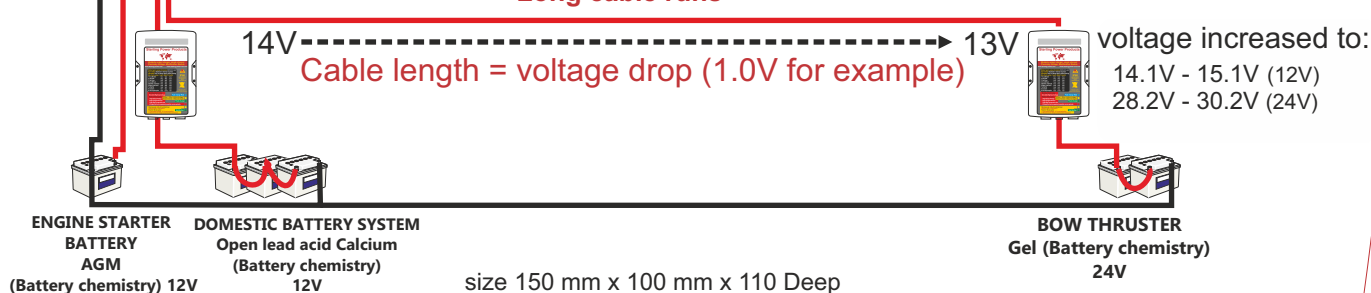


How NOT to use this product



Long cables, often to bow thruster/anchor winch batteries, can suffer from large voltage drops across the cables. By connecting a BCM near these end batteries you can compensate for large voltage drops and you can also charge at a 24V 4 stage charging profile.

Long cable runs



Battery Chemistry Module

Code	Description
BCM1260	12V-12V up to 60A Max 60A 12V charger
BCM2430	24V-24V up to 30A Max 30A 24V charger
BCM1224	12V-24V 10A (at 24V) Current limiting any 12V charger
TSD50	50 deg C = 122 deg F Digital temp sensor
TSD60	60 deg C = 140 deg F Digital temp sensor
TSD70	70 deg C = 158 deg F Digital temp sensor
TSD80	80 deg C = 176 deg F Digital temp sensor
BCMR	Battery Chemistry remote control plus 10m cable

Pro Charge Ultra **AQUANAUTIC**

Waterproof battery charger

expected
2019

- 12V | 24V | 36V | 48V models.
- 10A - 40A.
- 1 - 4 fully isolated outputs.
- *Independent charging profile for each output - unique feature.*
- **Active PFC - Global input 80-270VAC.**
- **Synchronised rectification for higher temperature operation.**
- **Pre-wired and pre-fused of 2m cable.**

Active Power Factor Correction (PFC 0.99-1). The Aquanautic is rated at over 86% efficient. Read page 51 on the importance of PFC.

Unique labyrinth gland sealing system ensuring a dual sealed system.

IP67 insulation for the vulnerable electronics system section.

IP56 well protected waterproof fan cooling system.

The dual seal ensures a light weight and compact footprint. Under extreme water saturation, the fan can be replaced with ease.

Battery Temperature compensation available as an optional extra. This also includes **external interlock switch**.

Multi Lingual. The Aquanautic comes with **front labels and instructions in different** languages: English, French, German and Spanish.

9 pre-programmed charging profiles for AGM, Gel, sealed/flooded and calcium batteries LiFePO₄. We also include a **customizable** option to allow the user to programme their own profile via the front panel. This includes voltages and time based features

Optional Remote Control (PCUAR)

- Charging voltage (V) and charge current (A)
- Voltage displays as individual battery banks or totalled if multi voltage banks used i.e. one bank 12V and one bank 24V (must be connected in correct sequence to achieve this).
- **Voltage readings can be used with charger not connected to AC source to assist in battery monitoring.**
- Battery charger sequence
- Multi coloured screen to depict faults or normal running
- Force select options available from remote control
- Charging stage and duration
- Configured battery type display
- Temperature of the charger
- Temperature of the battery
- Error Messages
- 110 x 68 x 20 mm
- 10 meters of cabling
- Remote housing - surface / recess / flush mounted

Truly Global Charger. The Aquanautic shall work at **AC voltages (80-270VAC and 40-70Hz)** and **DC voltages (130-320V)** input. Perfect for generators.

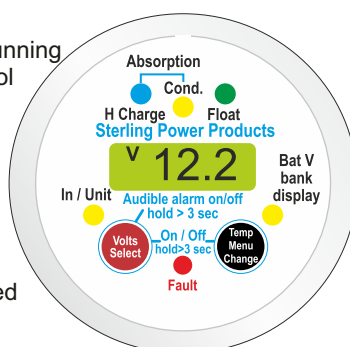
Comprehensive 22 LED front panel. The user is provided with a **voltmeter**. The panel also includes charging profile statuses and warning statuses.

Power Pack / Power Supply. This charger works effortlessly as a power supply to DC loads to prevent depletion of your battery capacity.

Perfect for generator use. Due to its active PFC tolerance of AC input it shall run from crude sine wave forms - typical from generators. Also, **% Power Reduction** you can set the charger to run at lower power outputs to complement a wider range of generators and low shore power connections.

Larger voltage / current requirements?

The Pro Charge Ultra series can be put in series or parallel with other Pro Charge Ultras. This is enabled by the charger's dynamic charging ability.



Pre-wired and pre-fused cable with 8 mm ring terminals. Up to 4 DC outputs, model dependent. 2m cable.

Multi Chemistry, Multi output.

This bespoke feature of the Aquanautic allows each output to have their own unique charging profile. This is advantageous if you have different battery types in one system. Using the bass boat example below, you could have a sealed lead acid starting battery and AGM trolling motor batteries. With this Aquanautic you can charge BOTH the AGM and the sealed lead acid battery at their correct charging profile, simultaneously. If you so needed you even could charge 4 different battery chemistries across the 4 outputs.

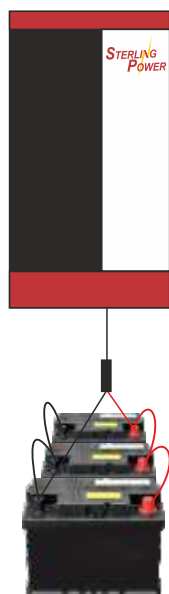
12V / 40A model, all other units pro rata
 Input voltage range 80-270V 40-70 Hz
 Power Factor at 230V 0.976
 Active power factor correction
 Efficiency 94.4%
 Full load current (110/230V) 9.8/4.6A
 Total Harmonic Distortion 2.4% voltage
 Total Harmonic Distortion 2.4% current
 Ripple noise (rms) 14mV
 Ground leakage 0.5 mA
 Generator / mains power (watts)
 12V 20A approx 350W
 12V 30A approx 500W
 12V 40A approx 600W

Charging groups and battery balancing.

You can set the charger to charge in voltage groups. I.e. if you have to charge a 36V bank and a 12V bank you can programme the charger to attribute the correct charging profile to the correct voltage group bank. It can determine which cell within the bank requires more current and which requires less and charges them appropriately.

Model	Current (12V)	Outputs	Code
12V 1 output	10A	1	PCUA101
12V / 24V 2 output	10A	2	PCUA102
12V 1 output	25A	1	PCUA251
12V / 24V 2 output	25A	2	PCUA252
12V / 24V / 36V 3 output	25A	3	PCUA253
12V 1 output	40A	1	PCUA401
12V / 24V 2 output	40A	2	PCUA402
12V / 24V / 36V 3 output	40A	3	PCUA403
12V / 24V / 36V / 48V 4 output	40A	4	PCUA404
Remote Control			PCUAR

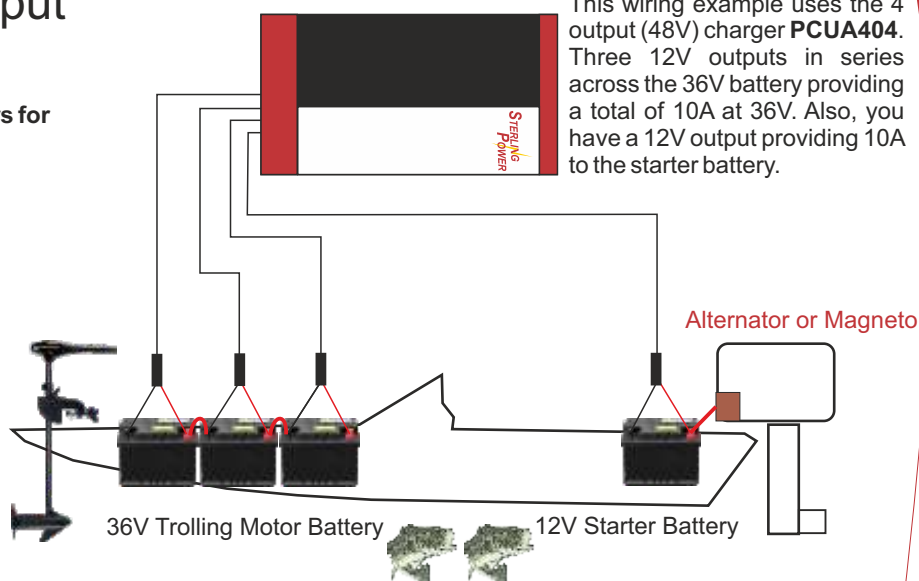
12V battery charging single output



Recommended chargers for this setup:

PCUA101
PCUA251
PCUA401

36V trolling motor and 12V starter

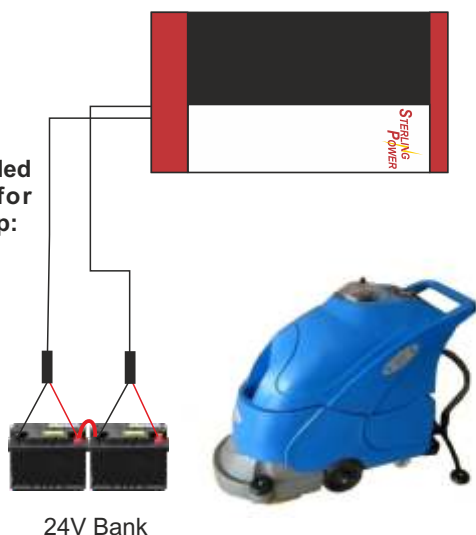


This wiring example uses the 4 output (48V) charger **PCUA404**. Three 12V outputs in series across the 36V battery providing a total of 10A at 36V. Also, you have a 12V output providing 10A to the starter battery.

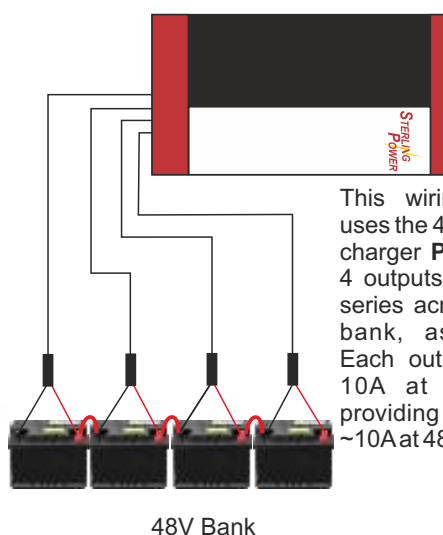
24V or 48V floor cleaner batteries (example).

Recommended chargers for the 24V setup:

PCUA102
PCUA252
PCUA402



24V Bank



48V Bank

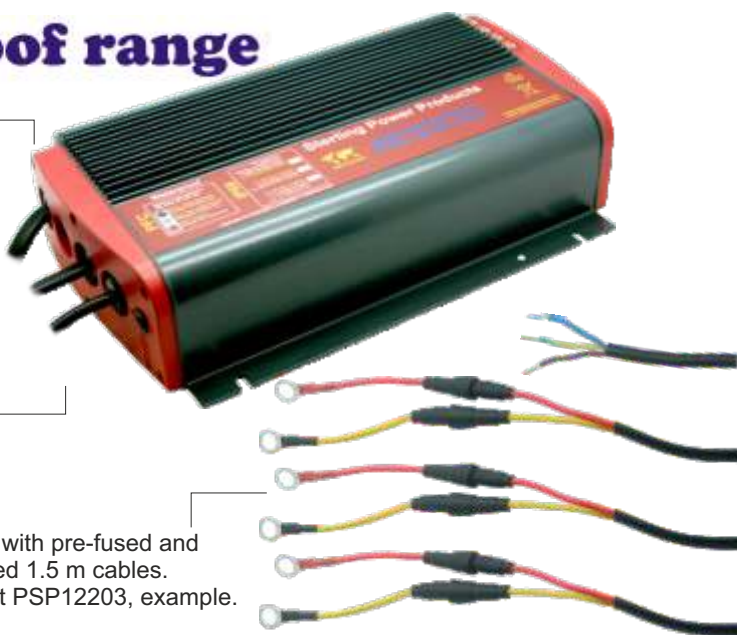
This wiring example uses the 4 output (48V) charger **PCUA404**. All 4 outputs are used in series across the 48V bank, as depicted. Each output provides 10A at 12V, thus, providing a total of ~10A at 48V.

Waterproof Battery Chargers

8-20A 1-3 fully isolated output Waterproof **Digital** Battery Chargers with fully **Active PFC**

AQUANAUTIC Waterproof range

The Waterproof **Aquanautic** battery charger is a fully sealed, fully waterproof and fully dust ingress/proof built to IP67 marine grade battery charger. The charger features **active power factor correction**, this allows for global **AC input (90VAC-270VAC)** and improved efficiency.



- Power Factor Corrected (active) 0.99-1 (PFC)
- 90VAC-270VAC input (47-70Hz).
- Extruded aluminum housing.
- Pre-fused and pre-wired with 1.5 m cable.
- waterproof built to IP67 standard.
- Adaptive charging, ensuring maximum charge in the batteries.
- LED power and charge indicators.
- Pre-fused and gold plated terminals.
- Up to 3 isolated outputs.
- Preset charging profiles AGM, Gel, flooded lead acid.
- Available in **8A / 12A / 20A**
- Available in **12V / 24V / 36V**
- Dynamic thermal output control, reduces power rather than over heats.

Comes with pre-fused and pre-wired 1.5 m cables.
3 output PSP12203, example.

Waterproof Aquanautic PFC 110-230V Active Power Factor Correction

Output (V)	Output(s)	Current (A)	L x W x D mm	Weight Kg	Code
12V	1	8A	180 x 170 x 65	2.5	PSP1282
12V & 24V	2	8A at 12V 4A at 24V	180 x 170 x 65	2.5	PSP1282
12V	1	12A	200 x 170 x 65	2.8	PSP12121
12V & 24V	2	12A at 12V 6A at 24V	200 x 170 x 65	2.8	PSP12122
12V	1	20A/12V	290 x 170 x 65	3.8	PSP12201
12V & 24V	2	20A/12V 10A/24V	290 x 170 x 65	3	PSP12202
12V & 24V & 36V	3	20A/12V 10A/24V 6A/36V	290 x 170 x 65	3.2	PSP12203

Pro Sport Range

- 12V 5A and 24V 5A (10A at 12V - 2 output)
- Moulded plastic case.
- Ignition Protected
- Epoxy filled, IP68 proofing.
- Adaptive charging, ensuring maximum charge in the batteries.
- LED power and charge indicators.
- Pre-fused and pre-wired with 1.5 m cable.
- Up to 3 fully isolated outputs.
- Dynamic thermal output control, reduces power rather than over heats.

The Pro Sport 5 and 5/5

A range of battery chargers designed to IP68 standard. Available in 5A and 10A models. 12V and 24V.



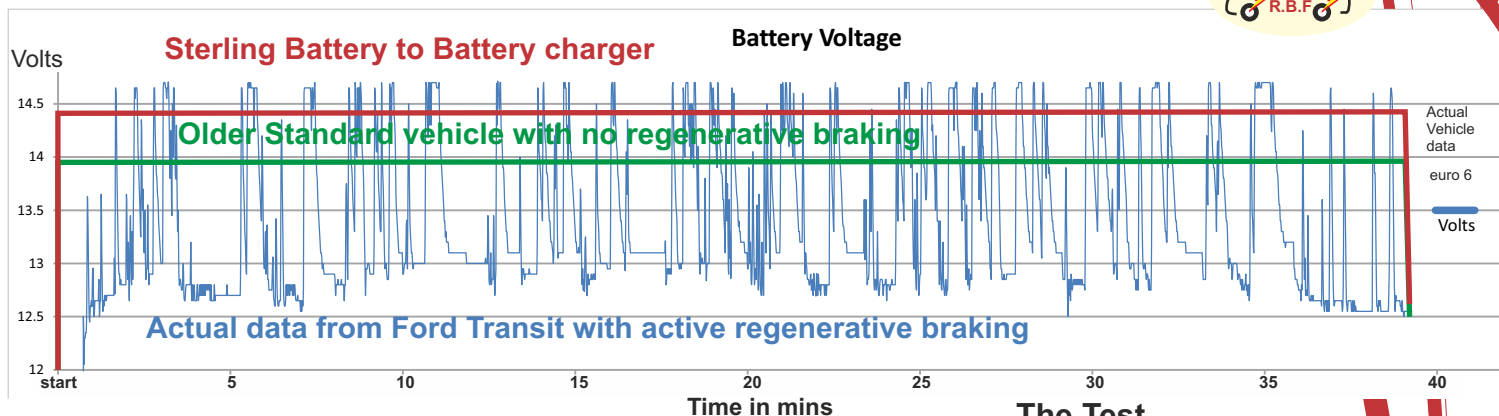
The Pro Sport 5
12V 5A only

The Pro Sport 5/5
12V/10A and 24V/5A

Pro Sport 5 and 5/5 Waterproof Battery Charger 230V AC 50 Hz only

Output (V)	Current (A)	Output(s)	L x W x D mm	Weight Kg	Code
12V	5A	1	75 X 150 X 65	2.5	PS125
12V & 24V	12V(2 x 5A) / 12V(1 x 10A) or 24V (1 x 5A)	2	230 X 130 X 90	3.5	PS1255

Voltage variations associated with vehicle regenerative braking / smart alternator Systems (Energy Recovery System) and what a Sterling Battery to Battery Charge does to rectify this problem.



What is Smart Alternator / Regenerative Braking?

The initiative behind the introduction of smart alternators / regenerative braking is to lower CO₂ emissions and to improve miles per gallon / KM per litre for EU regulations. These smart alternators are installed on modern European Vehicles (Euro 5, Euro 6 + and newer engine models).

The object of this new system is to utilise a vehicles wasted kinetic energy during braking / deceleration cycles experienced in every day motoring and rapidly convert as much of that energy (which is usually wasted as braking heat) into useful electricity and store this energy in the starter battery. Then, during acceleration and cruising release this energy back into the vehicles running system as "free electrical energy" thus reducing the time where a alternator loads the main engine. This increases MPG/KPL and lowers CO₂ emissions.

However, in order for this system to be effective, the starter battery must have 'free space' to boost the energy into the battery, this requires the battery to be about 20% depleted (low enough to allow more power to be boosted into it but not too low as to prevent the engine from restarting when switched off). To replenish this 'free space', during deceleration or braking events, the voltage on the alternator shoots up to approximately 15V+. This higher voltage fast charges the starter battery to replenish its capacity. As you are using the inertia of the vehicle to charge the battery, rather than fuel, it is seen as 'free energy'. Then the voltage drops to about 12.4V to allow the free energy to be consumed by the vehicle allowing the battery to deplete itself by about 20% ready for the next speed reduction and so on and so forth. Albeit an improvement in terms of emissions, there are knock on effects regarding the auxiliary charging systems on board commercial vehicles, read on:

Problems with Smart Alternator / Regenerative Braking

The system requires a 20% empty starter battery for the system to work. It needs the space to "dump" the fast energy build up during braking. This is in direct conflict with the auxiliary charging system requirements, why?

1) No charge going into the batteries during the 12.2-12.4V phase (which is totally by primary system design). Therefore, if a simple relay charging system was used to charge the auxiliary system it would not be charged during this time frame. In fact it can back feed any charge it has into the vehicle system. This will certainly be a problem if you require a charged auxiliary battery during travel or at location to location.

2) Very high battery charge rate during vehicle deceleration / braking due to alternator high voltage. This is relatively problem free for the starter battery as its relatively full. However, a large empty auxiliary bank will experience very high currents at high voltages (much higher than their recommended level) which would be detrimental to the battery (especially sealed, AGM and Gel) leading to premature destruction.

Problem with using voltage sensitive/controlled relays?

1) Most VSR / VCRs have 2-3 minute time delays before activating.
2) Even if the relay engages the massive voltage swings would prevent the second battery from getting any serious charge when on low voltage and would certainly damage many batteries when at high voltage due to the voltage and massive current in rushes.

The Solution Sterling Batt. to Batt. chargers 20-180A

Sterling's Battery to Battery Charger: The battery to battery charger range is designed to be connected between the starter battery and the auxiliary system. This unit will increase the vehicle's voltage to the auxiliary battery when it is low and reduce the vehicles voltage to the auxiliary battery when it is high. It will also NOT permit high current inrush beyond the rating of the product (even under high demand loads) and so delivers the auxiliary battery system the correct voltage for different battery types (programmable) regardless off the main system voltage swings, thus, protecting the auxiliary batteries from unnecessary damage. It ensures a constant, safer and much faster charge from the system.

It should also be noted that even on older vehicles or vehicles without smart alternators / Regenerative braking system, the Battery to Battery charger will charge auxiliary batteries much faster than conventional non active products such as relays. This product also has the ability to compensate for cable voltage drops over distance which will still result in up to a 10 times + faster charge rate.

The Test

Vehicle used in test (use graph for illustration)

Vehicle tested was a new (2013) Ford Transit van. Most, if not all vans and cars are now operating on this principle (no inditement to the Transit).

Route chosen:

The route involved some urban, then town, then motorway driving over about 40 minutes.

Graph / Voltage measured.

Blue line: Is the voltage measured at the battery from the Ford Transit using the regenerative system over the journey (acquired on actual journey).

Green line: Is the typical voltage one would see from a standard older vehicle not operation under regenerative braking control.

Red line: This is the voltage on the auxiliary battery sustained by the Sterling Battery to Battery charger regardless of the voltage on the input to the unit (or what ever voltage the unit is set for depending on the aux battery chemistry). The important thing to glean from this is that the Sterling unit is still boosting to 14.8V even when the input voltage drops to 12.6V. It also reduces the high 15V+ (not on the Ford sample) down to the correct 14.4V or 14.8V.

Conclusion: One can clearly see the voltage swing associated with the regenerative braking. Swing from 12.6V - 15.0V. this presents 2 major problems: When at 12.6V the auxiliary charging would simply be useless and at 15.0V it would destroy Gel / AGM batteries. Voltage swings with other manufactures have been in the order of 12.2V-15.4V. There are also massive current fluctuations which adversely affects fuse and cable sizes.

Be aware: Some unscrupulous vehicle sales companies are setting the vehicle ECU to a workshop mode setting where all the advanced voltage fluctuations algorithms associated with the Euro 6 are disengaged to facilitate fault finding in a workshop. This temporary condition is meant for workshop use only and puts the vehicle outside its compliance certification for road use. This renders the vehicle non complaint and therefore not legal. Anyone running vehicles in this mode should contact VW. Just see how running vehicles on non complainant software is working out for them.



WILDSIDE BBC - caravan charger

Allows leisure battery charging & fridge operation whilst towing.

Allows fridge to operate from leisure battery when un-hooked and away from a camp site (**WILDSIDE**).

Plug + Play can be installed with existing cabling.

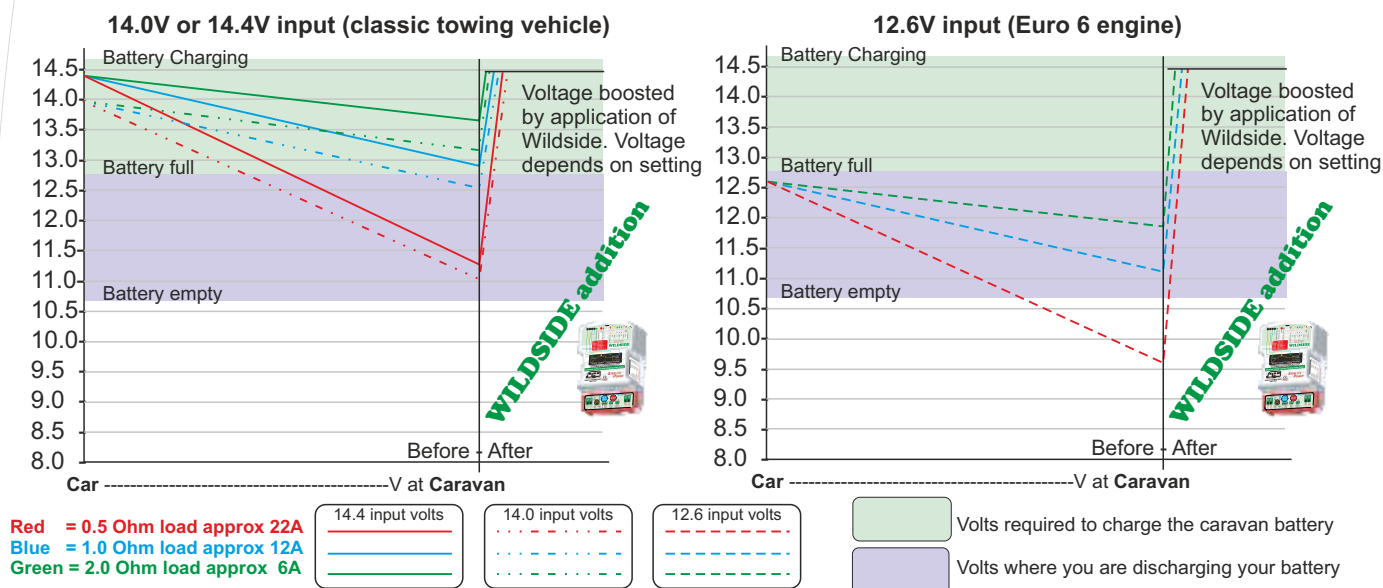
► The Existing Problem

Electrical requirements on board caravans are ever increasing. When at campsites this is no problem thanks to AC hook-up. However, if you tour and do not utilize these hook-ups and you find your fridge and mover not operating and your leisure battery not charging, this article is worth reading.

Still to this day, charging whilst towing is terrible. This is because the on board charging systems have not modernised by keeping up with on board electrical demands NOR by dealing with the contemporary peculiarities associated with Euro 6 engines on modern towing vehicles. Fridges do not run, leisure batteries do not charge, movers are ineffective etc. This is because the towing vehicle's alternator's voltage is dropping below the enabling threshold of the fridge and below that required to charge your batteries (read page 15). At current we have seen vast voltage drops down the cable.

Considering modern towing vehicles have large alternators it is shocking that their potential is not utilized.

Graph shows voltage drop across 2.5mm² copper cable. The cable is 8m of positive cable and 8m of negative.



► Graph analysis

The above is the best case you can expect. We have used good cables, no relays, no chassis negatives, no fuses and the connections were good. The green is the voltage where you need to be to have any chance of charging your caravan battery. The higher up the green area the better your battery charge will be. The purple is your battery depletion, the lower down you are on this the more power you have used and so the more "empty" your battery shall become.

The **Euro 6** graph is the most telling - when the alternator is not doing anything (12.6V) the chart begins within the purple (discharge section). However, the voltage which ends up in the caravan under load is so far below this due to the voltage drops in the cables. This means your fridge is receiving a very low voltages and it simply cannot operate at this low voltage. The simple conclusion is that, under Euro 6 conditions, you shall not be able to run your fridge nor charge your batteries. Therefore, there is actually no point having this connection.

The classic towing graph (14V), displays a modicum of battery charging at very low current. However, at moderate or high load, absolutely no battery charging shall take place.

► WILDSIDE addition

Adding Sterling's **WILDSIDE** takes this low input voltage and current but transforms the power from useless low voltage to a higher battery charging voltage (4 stage). Even at 0.5 Ohm load (22A) at ~9V the **WILDSIDE** unit boosts the output to the 14.4V charging regime for your typical leisure battery. By providing this boost not only do the leisure batteries get charged at an infinitely improved rate but the fridge is also brought online. Therefore, categorically, you can conclude that if you have a Euro 6 towing vehicle you shall neither charge your leisure battery nor run your fridge and shall require a **WILDSIDE** to achieve this. No Sterling, No charge, No Fridge.

An absorption fridge, when at 12V would consume in excess of 10A. Down at 8V, this is more like a 16A consumption. The **WILDSIDE** enables the fridge to operate, even at these extreme conditions, with a surplus of several amps to charge your leisure battery. Note, we recommend against the use of absorption fridge, as they are extremely thirsty. Possibly go with a compressor fridge (~2A).

► The Solution - requirements:

- 1) Deal with the massive voltage drop down the cables / plugs between the car and the caravan by boosting the low voltage to the correct voltage expected to charge the batteries. Also, reducing the voltage during the voltage highs associated with the new Euro 6 engines to prevent damage to equipment.
- 2) Utilize as much of the standard plug and wiring system as possible to avoid changing the basic system - for the sake of ease of installation.
- 3) Enable the fridge to operate (12V aspect), in transit, or remain (optional setting) in operation if not connected to 230V.
- 4) Charge the on board batteries, fast, using a 4 stage charging profile + 9 battery type programmes available. This ensures the battery is fully charged. Plus, a custom set option allowing the unit to be set up to any customer's personal choice. This ensures your electric caravan mover works when you arrive at your destination.

9 pre-programmed charging profiles for AGM, Gel, sealed / flooded, calcium and lithium (LiFePO₄) batteries.

BBC1225 - 25A input DC rating.

The BBC shall dramatically increase the charge rate (500%+) and shall compensate for poor connection and Euro 6 charging issues.

A clean and simple install in the main charging cable via the 20A conventional socket.

Shall easily double your useful battery storage capacity.

This constant current charger also enables the battery plates to stay much cleaner and last longer.

WILDSIDE mode. This mode allows the fridge to run directly from the 12V leisure battery irrespective of whether you are hooked up to a towing vehicle or not. We have implemented a low voltage cut off at 11V to prevent complete leisure battery discharge.

If you are to use the **WILDSIDE** mode we would recommend increasing the Ah capacity of your leisure battery.

WILDSIDE mode is not default. The default mode is campsite mode. Campsite mode isolates the fridge from the leisure battery when not towing but enables fridge operation when towing.

Charging modes:

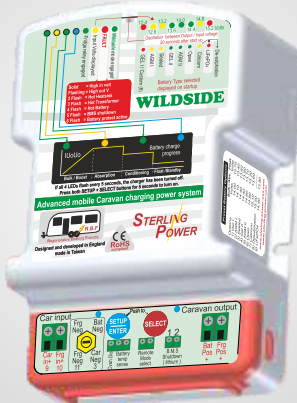
1) **Battery bias mode (default)**. This mode prioritises the leisure battery charging over running the fridge constantly. The BBC intelligently determines the state of your leisure battery. When the leisure batteries require charge, the fridge is offline and current is directed solely to the leisure battery. When it sees the leisure battery as sufficiently charged it shall bring the fridge online + simultaneously charge the leisure battery with any surplus. The BBC shall continually monitor the leisure battery. If the leisure battery begins depleting, due to a load, the BBC reverts to charging the leisure battery as priority.

2) **Fridge bias mode**. This mode brings the fridge online instantly and continuously, irrespective of leisure battery state of charge. Bringing the fridge online, particularly if the fridge is an absorption fridge, shall consume the majority of current. Any surplus current shall be directed to the leisure bank. Therefore, you shall likely still get battery charging, albeit less than battery bias mode.

Other Specification:

- 80A fridge engage relay.
- Automatic operation.
- OEM lock, to prevent tampering.
- 16 LED information and alarm panel.
- Optional battery temperature compensation.
- Thermostatically controlled fan cooling.
- High grade fire retardant plastic case.

Release date
Dec 2017

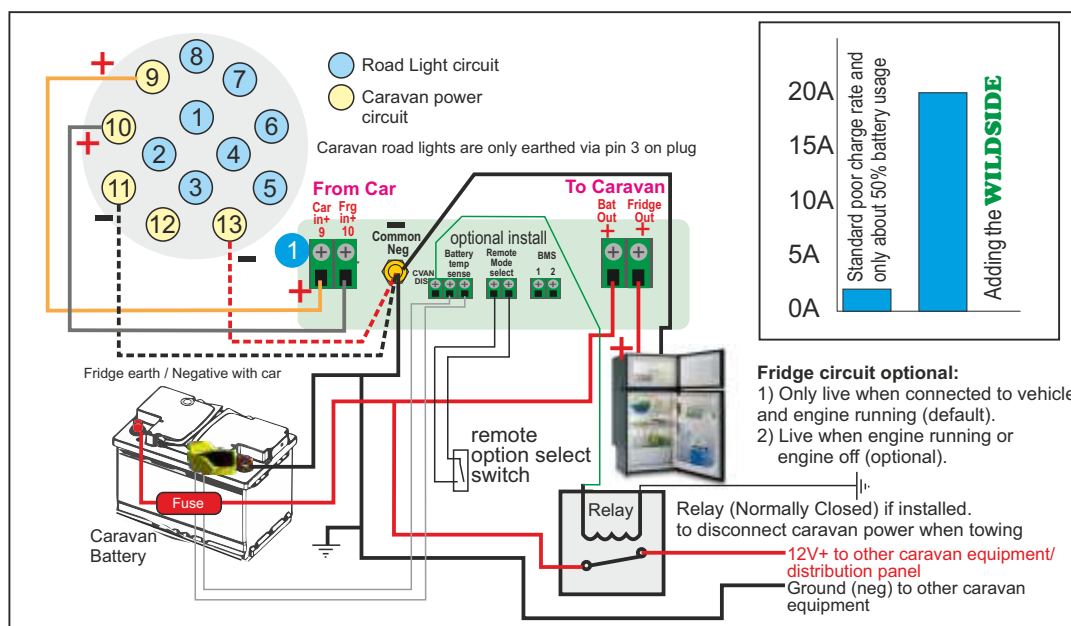


Optional battery temperature sensor with compensation (TSAY)

BBC1225 performance table

Input Current	Alternator Voltage	BBC input Voltage	BBC total output voltage current
25A	12.4V	10.7V	14.4V @ 15.5A
25A	14.0V *	12.4V	14.4V @ 17.6A
25A	15.0V *	13.4V	14.4V @ 19.0A

* Voltages under regen. braking system



DC V (in)	DC V (out)	Current (A)	Weight (Kg)	L x W x D mm	Code
12V	12V	25A input	0.9	160 x 96 x 55	BBC1225

Power Distribution Panel

Campervan power panel

Sterling Power's campervan power distribution panel (PDP) is a vastly superior, bespoke alternative to the existing power distribution panel currently in the campervan market. Below are 40 features that the Sterling PDP does that sets it way ahead and beyond any of its rivals. It has been designed intentionally to be swapped in place for existing panels of its type. Therefore, the PDP has been designed to have a certain familiarity for those who have always used them. For a conventional system to come close to competing with this product, and offer as many features as this system does, would cost many hundreds of pounds extra in product and installation costs - making this product very low cost and great value.

1. Charger is EU legal, complies with all the normal standards. EN 61000-3-2- Limits for harmonic current emissions.

2. The unit is E marked (type approved) so can be installed in new OEM vehicles.

3. Auxiliary and engine battery charger even with panel off but charger on.

4. Approximately 50% less volume than competitors' alternatives, with a smaller footprint.

6. Digital / software controlled system for simple use yet offering complex operations.

5. Fan cooled, thematically controlled multi speed fan to ensure max performance even in the hottest conditions with minimum noise.

7. A 1A trickle charge for engine starter battery for long term maintenance to compensate for long term starter battery drain.

9. Remote battery charging sense, allows the battery charger to read the voltage on the battery banks allowing the voltage drop on the charging cables to the compensate for allowing perfect battery charging.

11. Easy replacement / upgrade access to charger and other parts.

12. All plastic parts are made with fire retardant plastic.

13. Shore power to DC Battery charger (digital progressive) 4 stage constant current. With battery type selection including: AGM, GEL, sealed lead acid, open lead acid and lithium profiles.

Battery Capacity Meter



14. Battery charger flashes on start up to show which battery type

15. Battery capacity meter changes with battery type selected for charger.

16. Solid green lights (LEDs) change to slow flashing when under battery power to conserve energy.

17. More positive and stable fuse and contact covers.

USB x 2 ports 5V / 2.0A



18. Option to allow power sockets and USB connectors to remain active with vehicle on the move.

Ideal for charging phones / tablets when moving or stationary.

19. Optional battery temperature sensor for temperature compensation.

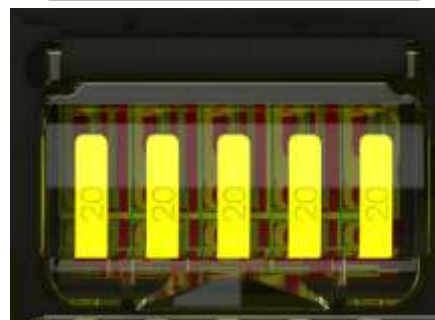


panel view

Membrane switches allowing for simple easy use of product.

Fault lights flash at multiple rates to indicate different system faults to aid fast and accurate fault diagnoses.

DC fuse box containing 5 fuses



20. DC fuses LEDs to show if a fuse is blown and which one has failed.

► Euro 6 Compatibility

21. Default is set for Euro 6 (regenerative braking vehicles). As such, there is no charge through the unit - all auxiliary battery charging is via a **Battery to Battery Charger** – you select the power you require (20A, 30A, 60A, 120A option).

Option 2, engage the split charge voltage sensitive relay charge system, this allows conventional charging via a relay to take place. There is an 80A charge circuit and will engage and disengage according to the vehicle's engine being on / off. This is suitable for all non-Euro 6 / non-smart alternator systems.



Option 1 (default)

Battery to Battery charger range



Option 2 (default)

VSRs and Ign. Fed relays

22. Aux battery protection, DC latching relay also acts as a low battery voltage disconnect to prevent total depletion and destruction of the domestic battery, trigger point is 10.5V (depending on battery type). Lights switch off then on for a few times to show there is a problem. Auto re-engages when charger or vehicle engine's started. Can be safely overridden by pushing button for 10 seconds. This removes all the control and allows the battery to totally deplete. Warning given in instruction about battery destruction.



rear view

23. Use of more expensive latching relays over conventional relays. No relevant power consumption in control panel when on.

24. No un tethered AC cables in AC system. This reduces any problems caused by cables vibrating and breaking.

25. Engine relay battery start protect. This setting for engine battery connection can cut off at say 12.3V which should also allow safe use of the engine battery and also allows the engine to start.

26. BMS lithium remote charger shutdown option.

27. We have provisioned for larger cable connectors to allow for greater charging performance. We use 6mm bolts to allow for larger cables. This improves performance over the thin wiring looms that have conventionally been installed - that are appalling.

29. DC input cables can be easily shared with Sterling's Battery to Battery Charger or split charge relay.

30. Total isolation between DC and AC on back of unit up to AC/DC safety standards.

31. Clear concise wiring instructions on the product.

32. We do cater for users who wish to combine starter and auxiliary batteries through the distribution box via internal latching relays – discussed overleaf. Generally recommended for those with older (non-Euro 6 engine).

33. No battery charging directed through the distribution box on default . Separation of charge and discharge aspects. This is a massive advantage. It is absolutely impossible to make a 1 box fits all charging solutions. For example, you may have a large alternator but only a small auxiliary battery bank requiring low current charge. Or, you may have a large auxiliary bank with a large direct power requirement for inverters which may require high direct current capability from the alternator. This can be easily achieved by upping the power performance of the charging device independent of the panel.

35. Solar surplus power will also be diverted to the starter battery. This is automatically activated by voltage on domestic battery bank so it works in the event of solar charge on domestic battery bank. It has a 3 minute time delay to allow battery to battery charger to fail (not start up). It engages at 13.1V. It is best positioned on the DC board rather than the battery charger board. This is shown on the main panel as EBM, Engine Battery Maintainer.

28. Feed can be supplied to show engine on; i.e. to engage the fridge. This can be done electronically (voltage sensing) without an extra ignition cable. LED on front to show fridge on DC mode i.e. engine running and relay engaged. Hard wired option allows fridge to run direct from DC.



top view

34. You may have different battery types and require special charging regimes. You may have an older engine or a modern Euro 6+ with regenerative braking. All of these require different charging regimes. It is more effective to not allow any vehicle charge ability through the control which would invariably diminish the vehicle's ability for charging the auxiliary battery system. It is much better to treat the vehicle's charging aspect separate from the discharge system so this can be correctly installed.

Power Distribution Panel			
Device	L x W x D (mm)	Weight Kg	Code
12V PDP	203 x 143 x 185	2	PDP
Temperature Sensor		NA	TSAY

Battery to Battery Chargers

Non Waterproof (Drip Proof IP21)

12V | 24V | 36V | 48V
20A-70A Input Models
(larger units overleaf)

Euro 6+ friendly

Sterling's range of Battery to Battery Chargers (B2Bs) has grown significantly over the past few years. Offering a product range in this market un surpassed by anyone in both power and flexibility. This is in an effort to supplement the ever growing demand from the commercial vehicle, recreational vehicle and marine industries. The B2Bs have become extremely popular as they fast charge batteries as you cruise along without the need for complex wiring, touching your alternator, voiding the alternator's warranty and tampering with the electronic control units (ECUs). You can provide the onboard batteries with a fast 4 stage charging profile with a very simple and speedy installation. All of the benefits of advanced charging without any of the drawbacks. Simply connect the B2B between the battery being charged and the battery you wish to charge.

Read about regenerative braking and the test that Sterling did. **Page 15.**



3 activation modes:

1) Automatic - Default, operates on input voltage (13.3V / 26.6V on) and complements regenerative braking with low voltage timer. No ignition feed required.

2) Ignition feed with timer. As above, however, requires a live ignition feed to operate. Input voltage figures and timings, as above.

3) Ignition feed without timer. As above, however, the timer does not kick in, so it can potentially stay on indefinitely provided input voltage stays above a certain low threshold.

The default mode, which is Automatic Regenerative Braking Friendly, does not require an ignition feed to operate. It works on input voltage and timing algorithms (These values can be customised on the unit). This is ideal for most setups as ignition feeds are getting increasingly hard to find on modern vehicles, this new unit is therefore simple to install.

Very simple to install. No Electronic Control Unit (ECU) issues. No complex wiring. No Warranty issues. Fully prepared for smart alternators (**Regenerative braking**). 95% off installations are simply out of the box with no setup.

4 stage battery charging. The B2B charges batteries between 5-20 times faster than a stand alone alternator.

OEM lock: the unit can be locked by the installer to prevent tampering and misuse of the product by the operators. By locking the BB, you secure all previous settings in place and prevent subsequent tampering.

9 preset battery chemistry options including AGM, LiFePO₄, Gel, flooded and sealed lead acid.

Customizable profile - choose your own charging profile on the front panel.

B2B turns on at 13.6V and turns off at 13.3V (x2 for 24V). Thus, does not drain input battery. **Regenerative braking mode** shall allow the input voltage to drop to 12.2V (x2 for 24V).

Boost / Reduce Charging. The B2Bs ensure batteries get the correct charging profile irrespective of high or low input voltages.

BB1260
BB122470
BB241235
BB242435
BB123670
BB124870

BB1230

Output charging at **12V, 24V, 36V and 48V.** Input voltages at **12V and 24V. Up to 800W rating.** Much larger model up to 3000W coming soon.

No risk of starter battery discharge. Current is **NOT** taken from the input battery and given to the output battery except during the low voltage timer for regenerative braking mode. This time frame can be increased in length or brought down to 0 seconds.

Safety features:

- 100% fire proof plastic box
- no screws to corrode
- thermal power reduction
- multi stage fan cooling

Dynamic thermal charging, the charging voltage fluctuates based on the temperature of the sensor (included ->).

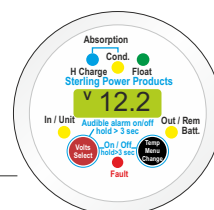


1 x temperature sensor (TSAY) included in all units.

Unit is current limiting, prevents large current flow and requires less cable thickness.

Adjustable current limit. The current limit can be reduced to 50%.

Night time setting allows the unit to run at 1/2 power so the fan noise is kept down.



Remote Control (Optional)

Displays: Voltage / Warnings / Temperatures. Can be used as an independent voltmeter measuring input battery voltage and output battery voltage.

Can remotely modify the Batt. the Batt. Charger:

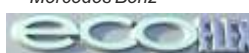
- Force the unit to float
- Force the unit to 1/2 current limit
- Force the unit to standby
- Force the unit off
- Force the unit to Night Mode
- Reset both Remote and Charger

E marked.
Suitable for
OEM fitting.



® Trademark of
Mercedes Benz

® Trademark of
Volkswagen



® Trademark of
Vauxhall / Opel

® Trademark of
Ford

DC V (in)	DC V (out)	Current (A)	Weight (Kg)	L x W x D mm	Code
12V	12V	30A input	1.2	190 x 160 x 50	BB1230
12V	12V	60A input	1.4	190 x 160 x 70	BB1260
12V	24V	70A input	1.4	190 x 160 x 70	BB122470
12V	36V	70A input	1.4	190 x 160 x 70	BB123670
12V	48V	70A input	1.4	190 x 160 x 70	BB124870
24V	24V	35A input	1.4	190 x 160 x 70	BB242435
24V	12V	35A input	1.4	190 x 160 x 70	BB241235

Remote w/ 10m cable

BBURC

German, French, Spanish main label overlay sticker



Waterproof Battery to Battery Charger 12V 60A-120A

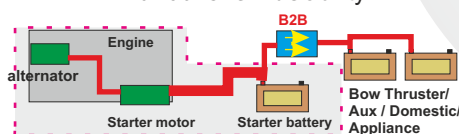
Waterproof (built to) IP66 models. These units have the benefit of being epoxy potted so that the charger is sealed off from water and dirt ingress. The cooling fan is not sealed and is rated at IP55, the fan is designed to be easily replaced in the event of major immersion.

The default mode, which is Automatic Regenerative Braking Friendly, does not require an ignition feed to operate. It works on input voltage and timing algorithms (These values can be customised on the unit). This is ideal for most setups as ignition feeds are getting increasingly less common and it makes this unit very simple to install.

9 preset battery chemistry options including AGM, LiFePO₄, Gel, flooded and sealed lead acid.

60A and 120A models. Only in 12V. Features are similar to that of the non-waterproof models.

Regenerative braking and manual override ability.



Simple Wiring Diagram. Illustration to show the most common B2B setup. Whether, for charging bow thrusters banks on boats or for charging domestic banks on RVs or commercial vehicles.

Very simple to install. No Electronic Control Unit (ECU) issues. No complex wiring. No Warranty issues. Fully prepared for smart alternators (**Regenerative braking**).



120A



60A

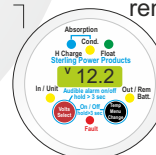
Safety features:

- 100% fire proof plastic box
- no screws to corrode
- thermal power reduction
- multi stage fan cooling

9 pre-programmed charging profiles for AGM, Gel, sealed/flooded and calcium batteries and desulphation modes.

Dynamic thermal charging, the charging voltage fluctuates based on the temperature of the sensor.

Current Limit Adjustment current limit can be reduced in increments off 10% using remote control only



Remote Control (optional)



1 x Temperature sensor included



E marked.
Suitable for OEM fitting.
BBW1260
BBW12120

Input DC	Output DC	Current (A)	L x W x D mm	Weight	Code
12V	12V	60A input	145 x 110 x 120	3 Kg	BBW1260
12V	12V	120A input	170 x 130 x 125	3.5 Kg	BBW12120
Remote control			54mm diameter		BBRCN

12V Alternator direct output power Linearisation Device (ALD)

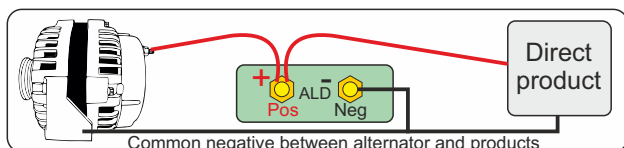
17.5V 70 F

Total alternator control. Certain applications require current and voltage control directly from the alternator's output - lithium battery charging, for example. This is not straight forward. The problem is that an alternator produces a half wave, non filtered wave form. This is a poor quality output and could not be used directly into any normal equipment without using a battery as a buffer. Failure to do this will destroy the equipment. In addition, lithium batteries require a shut off system so at any time the alternator could become a unloading fast which would destroy the alternator. This is prevented under normal use as an alternator is always connected to a battery. The battery absorbs all the spikes to make a relatively smooth linear power supply. The battery is crucial to achieving this smoothness and also allows the alternator to be unloaded without destroying the alternator.



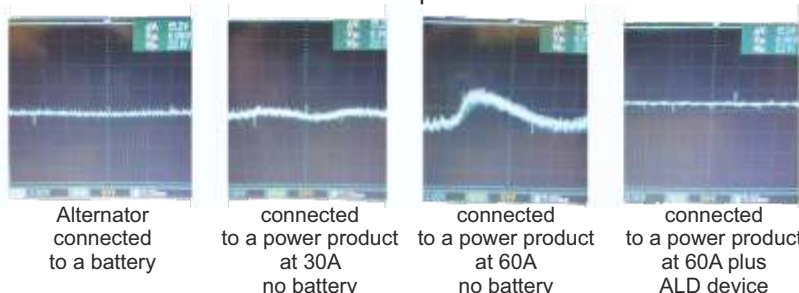
The solution. The ALD fits directly onto the alternator's output. The ALD absorbs the large spikes from the alternator's generation system and also offers itself as a buffer to absorb the alternator's power during electrically unfriendly events that occur during lithium charging. This product is essential if alternators are used directly onto Alternator to Battery Charger or Battery to Battery Charger without being attached to a starter battery.

Do not use with Euro 5/6 engines



Numerous benefits over a normal 12V starter battery? The ALD is smaller and lighter than a regular starting battery. Batteries also need maintaining, they gas, they may over charge and they do not like being transported - the ALD does not suffer from any of these issues. The ALD also acts as a very prominent alternator protection device, sheltering your alternator from any harmful back spikes.

Alternator output wave form



DC	L x W x D mm	Weight	Code
12V	190 x 160 x 70	1 Kg	ALD12500

Battery to Battery Chargers

VHP range (Very High Powered)

120A - 240A 12V to 12V battery to battery chargers. For those with large alternators and large demands.

3 activation modes:

1) Automatic - Default, operates on input voltage (13.3V / 26.6V on) and complements regenerative braking with low voltage timer. No ignition feed required.

2) Ignition feed with timer. As above, however, requires a live ignition feed to operate. Input voltage figures and timings, as above.

3) Ignition feed without timer. As above, however, the timer does not kick in, so it can potentially stay on indefinitely provided input voltage stays above a certain low threshold.

Very simple to install. No Electronic Control Unit (ECU) issues. No complex wiring. No Warranty issues. Fully prepared for smart alternators (**Regenerative braking**).

Dynamic thermal charging, the charging voltage fluctuates based on the temperature of the sensor (included ->).

Adjustable current limit. The current limit can be reduced to 50%.

Safety features:

- 100% fire proof plastic box
- no screws to corrode
- thermal power reduction
- multi stage fan cooling

1 x temperature sensor (TSAY) included in all units except the BB1220 where it can be purchased as an optional extra.



® Trademark of Mercedes Benz



® Trademark of Volkswagen



® Trademark of Vauxhall / Opel



® Trademark of Ford

4 stage battery charging. The B2B charges batteries between 5-20 times faster than a stand alone alternator.

The default mode, which is Automatic Regenerative Braking Friendly, does not require an ignition feed to operate. It works on input voltage and timing algorithms (These values can be customised on the unit). This is ideal for most setups as ignition feeds are getting increasingly hard to find on modern vehicles, this new unit is therefore simple to install.

Current is NOT taken from the input battery and given to the output battery except during the low voltage timer for regenerative braking mode. This time frame can be increased in length or brought down to 0 seconds.

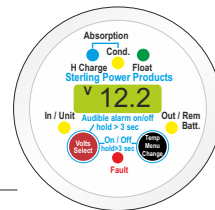
9 preset battery chemistry options including AGM, LiFePO₄, Gel, flooded and sealed lead acid.

Customizable profile - choose your own charging profile on the front panel.

B2B turns on at 13.6V and turns off at 13.3V. Thus, does not drain input battery. **Regenerative braking mode shall allow the input voltage to drop to 12.2V (x2 for 24V).**

Boost / Reduce Charging. The B2Bs ensure batteries get the correct charging profile irrespective of high or low input voltages.

Night time setting allows the unit to run at ½ power so the fan noise is kept down.



Remote Control (Optional)

Displays: Voltage / Warnings / Temperatures.

Can be used as an independent voltmeter measuring input battery voltage and output battery voltage.

Can remotely modify the Batt. the Batt. Charger:

- Force the unit to float
- Force the unit to 1/2 current limit
- Force the unit to standby
- Force the unit off
- Force the unit to Night Mode
- Reset both Remote and Charger

54mm diameter



DC V (in)	DC V (out)	Current (A)	Weight (Kg)	L x W x D mm	Code
12V	12V	120A input	3	250 x 245 x 95	BB12120
12V	12V	180A input	4	320 x 245 x 95	BB12180
12V	12V	240A input	5	390 x 245 x 95	BB12240
Remote w/ 10m cable					BBURC

Pro Charge B - Waterproof Battery to Battery Charger

(built to IP68)

12V 24V 36V 48V
Up to 28A at 12V Input



The Pro Charge B is a fully epoxy encapsulated, plug and play, battery to battery charger. It is primarily designed to be put between the starter battery and an appliance battery (trolling / bow thruster / domestic). The charger puts a load on the alternator and converts that load into a 4 stage charging profile to provide fast and effective charging to the leisure/domestic batteries. The whole point of the charger is to charge your batteries up when you drive/cruise along by fully utilizing your on board alternator. The charger is best suited for alfresco use to fully utilize its weatherproof casing. Therefore, it tends to be at home on bass fishing boats charging the trolling motor bank - it can be used in a plethora of other places.

Boost / Reduce Charging. The Pro Charge B shall ensure your batteries get the correct charging profile for your batteries irrespective of high or low input voltage.

Multiple units can be used on the same installation.

up to 400W rating.
Output charging at 12V, 24V, 36V and 48V. Input voltages at 12V and 24V.

Pre-Wired and Pre-Fused cables. 1.5 m / 70 inches cable length.



IP68, totally waterproof, fully encapsulated, can be submerged in water.

Thermal power reduction, allows for short high power runs to maximise power transfer.

Various activation modes.

Automatic mode works from sensing voltage. **Manual mode** works from switch over ride. **Regenerative braking mode** the chargers stays on down to 12.2V.

Battery Chemistry type selection.

6 battery chemistry types including AGM, Gel, sealed / flooded lead acid and LiFePO₄.

Suitable for battery banks up to about 300Ah at 12V.



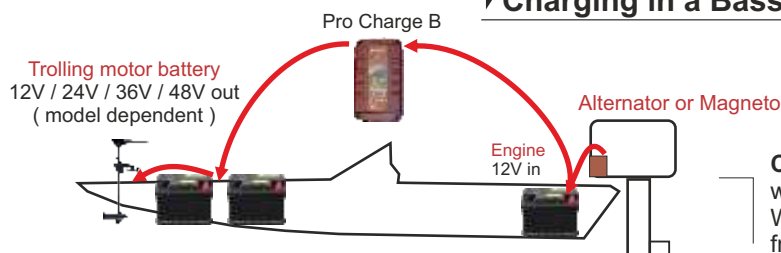
E marked.
Suitable for OEM fitting.

Battery to Battery chargers / IP68 FULLY WATERPROOF

Input (VDC)	Output (VDC)	Input Current (A)	L x W x D mm	Weight Kg	Code
12V	12V	25A*	230 x 135 x 65	3	BBW1212
12V	24V	25A*	230 x 135 x 65	3	BBW1224
12V	36V	25A*	230 x 135 x 65	3	BBW1236
12V	48V	25A*	230 x 135 x 65	3	BBW1248
24V	24V	13A	230 x 135 x 65	3	BBW2424
24V	12V	13A	230 x 135 x 65	3	BBW2412

* 28A for about 30 minutes then drops to about 18A on thermal restriction

Charging in a Bass Fishing Boat



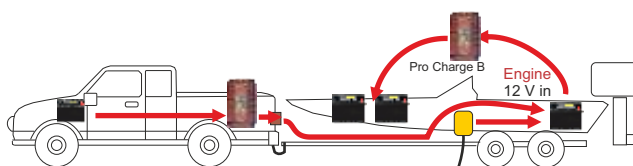
Charging performance of alternator or magneto without a **Pro Charge B** will produce about 1-2A. With a **Pro Charge B** you can expect the output from the charging source to run at a much higher rate - **up to 28A at 12V**. Larger alternators do not adversely affect the product as its **current limiting**.

Prime Wiring example.

Not only does the **Pro Charge B** connect the 12V starter battery to the trolling motor bank it also charges them at their correct voltage scale and profile. This encourages the alternator to work at a much higher capacity and results in faster charge between fishing stops and better maintenance of your trolling motor batteries.

Ultimate Wiring example.

Why not charge the bass boat batteries while driving along? Connect a **Pro Charge B** from the truck starter via an Anderson type socket at the back of the truck to the **Prime Wiring** setup. This example allow you to fast charge while driving to and from the lake and then while cruising on the lake.



Shore Power Charger (AC to DC).

Directing shore power to the engine starter battery shall activate the **Pro Charge B** to charge the trolling motor batteries at their correct profile at 12V / 24V / 36V / 48V.

Lithium Batteries

12V 100Ah / 120Ah LiFePO₄ + BMS + Safety Shutdown

For many years people have wanted a simple easy solution to installing lithium batteries in the automotive industry: Including commercial vehicles, campervans, caravans, military, police and ambulances. However, due to the specific incompatibility with charging voltages and currents on board the vehicles and the requirements of the battery, the two things simply could not be safely brought together without a very elaborate intermediary system linked into a BMS for the lithium battery.

All this is not gone; today we have lithium batteries with built in BMS and automatic shutdown systems that take care of the extreme faults that may be presented to a lithium battery. With the simple addition of a Battery to Battery charger the correct voltage and current profile is provided to the battery from the vehicle's alternator with no integration fuss. This means, when your alternator voltage is low, the battery to battery charger increases the voltage and when your alternator's voltage is too high the battery to battery charger decreases it. Also, when you have too much current, the battery to battery charger reduces the current, thus, presenting the lithium battery with its ideal safe voltage and current requirements. This has never been so important than with the modern Euro 5/6 vehicle applications. The first, all in one - simple to install - package that removes all fears with this technology for application on vehicles.

Lithium battery capacity is 100% usable, unlike that of lead acid's 50%.

Lithium batteries are also less than half the weight of the equivalent lead acid. This means that the available energy per weight ratio is 4 times better with lithium batteries.

E13

4 batteries can be linked in series to make up to a 48V battery bank.

Unlimited batteries can be linked in parallel to increase Ah capacity, increase charge and discharge rates.

Strap on the 100Ah model to aid with lifting.

Handles on the 120Ah model to aid with lifting.

Cell type is prismatic

recommended charging voltages:
Absorption: 14.6V
Max charge: 14.8V
Float: 13.6V

12V 100Ah Model

12V 120Ah Model

BMS and Safety features :

- Automatic fault recovery system.
- Internal cell thermal safety fuse.
- Flame retardant electrolyte.
- Fire retardant plastic case.
- Explosion proof stainless steel cells.
- Built in Battery Management System - cell balancing.
- Automatic battery protection system - internal.
- Automatic low voltage disconnect at 10V.
- Instant automatic short circuit protection.
- Protects the battery when high/low voltage | too high current and too high temperature.

12V 100Ah Specification:

- LiFePO₄ 12.8V (nominal).
- 100Ah 25 deg C Lithium Deep cycle
- Actual usable power capacity - 1280Wh
- Maximum continuous charge rate 0.5C = 50A
- Maximum continuous discharge rate 1C = 100A
- Intermittent discharge rate is 200A for 30 seconds
- Battery must be safely charged within units parameters
- Max charge V=14.8V, Recommended =14.6V, Float V=13.8V
- Cut off voltage 10V / cutoff temperature 50 deg C
- Charge Curve style CC/CV
- Operational temperature -30 to 60 deg C
- Internal consumption: Operational = 10mA, Dormant 0.1mA
- E13 marking. 10R00-10R05-14430-00

12V 120Ah Specification:

- LiFePO₄ 12.8V (nominal).
- 120Ah 25 deg C Lithium Deep cycle
- Actual usable power capacity - 1536Wh
- Maximum continuous charge rate 0.45C = 50A
- Maximum continuous discharge rate 1C = 120A
- Intermittent discharge rate is 240A for 30 seconds
- Battery must be safely charged within units parameters
- Max charge V=14.8V, Recommended =14.6V, Float V=13.8V
- Cut off voltage 10V / cutoff temperature 50 deg C
- Charge Curve style CC/CV
- Operational temperature -30 to 60 deg C
- Internal consumption: Operational = 10mA, Dormant 0.1mA
- E13 marking. 10R00-10R05-14429-00

DC (V)	Capacity (Ah)	Weight (KG)	L x W x D cm	Code
12V	100	14.4	33.0 x 21.5 x 17.0	AL12100
12V	120	15	41.0 x 23.5 x 17.0	AL12120



Positive and negative terminals with bolt / thread and washer.

What is C rating?

C essentially means the battery's charge rate to Ah capacity. 0.5C for a 100Ah battery means you can charge the battery at 50A. The number before the C denotes the fraction of the Ah capacity to charge at. E.g. $0.5 \times 100\text{Ah} = 50\text{A}$. Look out for terms such as continuous rating and maximum rating. You are only interested in the continuous rating figure. This is what you should rate your battery charger to.

Life expectancy

An average AGM battery claims 1000 cycles. In real world use, due to over charging and deep discharging this figure dramatically diminishes. Lithium batteries are not as affected by depth of charge and discharge. 20x longer life.

What to look for, sales jargon.

Different lithium battery specification, what to look for:

- 1) Ensure C rating is at least 0.5C.
- 2) When C is before the number (C1) this really means 0.1C.
- 3) Maximum charge and discharge ratings need to be quantified with a time scale. 3C for 30 seconds would be an honest value. Just stating 3C without a timescale is misinformation.
- 4) Ensure the battery has its own shut down ability. Over charge, over voltage over temperature etc. This is vital.

Lithium, a straight swap from Lead Acid?

NO! Lithium batteries MUST be charged with correct voltage profile and current rate. To regulate for correct voltage and current we would recommend looking at our Battery to Battery chargers.

Chassis weight

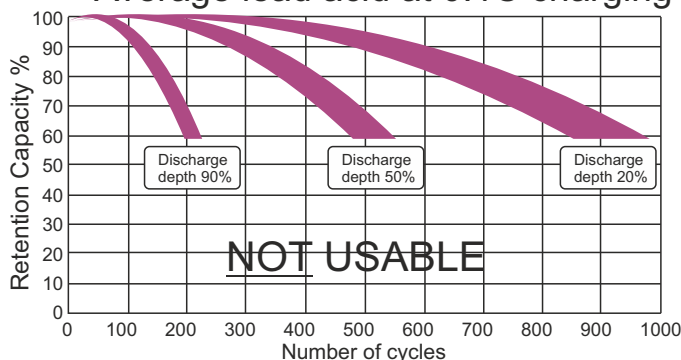
Lithium batteries are generally half the weight of their lead acid equivalents. You also get twice the available (real world) Ah capacity. This makes lithium batteries 4x more effective at delivering the same power to weight ratio. This is extremely important if chassis weight is of importance.

Through power and exceeding lithium's rating?

A good example for this is say, a VW campervan, where you want to charge a 100Ah lithium battery (and only have the physical room for 1 battery) from the vehicle's alternator. Modern alternators are about 2000W, the 30A battery to battery charger will charge the lithium battery at about 25A and have no problems as far as charging the battery is concerned. However, you may want to fit an inverter (say a high powered one at 1500-2000W) to run a hair dryer / microwave / coffee machine. Although your 100Ah lithium battery would run 1000W for 1 hour you may not want to deplete your battery bank. You may simply wish to start your engine to through put power directly from the engine's alternator to the inverter to relieve some of the drain from the battery to run the equipment. As you have fitted 30A battery to battery charger the through power would only be 350W, however, if you had fitted a 60A battery to battery charger the through power would be 800W. If you needed more through power look forward to Sterling Through Power Device. This enables you to essentially charge the lithium battery at its correct current rating + allow for current from the alternator to bypass the battery, straight to the appliance, to prevent detriment to the lithium battery.

Manufacturers' marketing myths

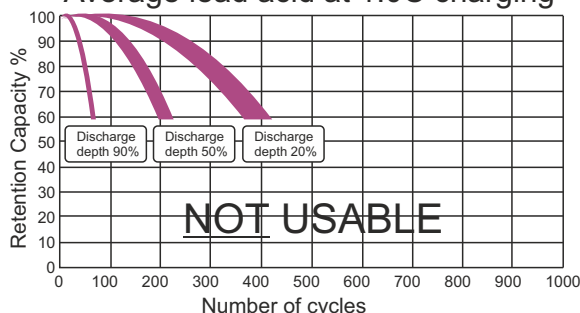
Average lead acid at 0.1C charging



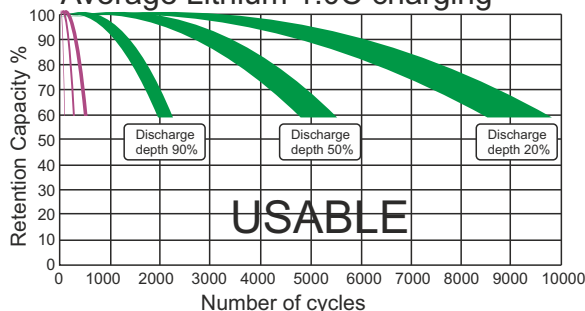
This graph is what lead acid battery manufacturers want you to see, yet not understand. Charging at a 0.1C rate and discharging by only 20% to claim your 1000 cycles is simply not real world testing. This implies that someone who has a 100Ah battery uses a 10A charger and only discharges the battery by 20% and then recharges it. In reality, your charger is an alternator of 100A+ (1C) and you'll discharge the batteries to 50%+ before recharging. This shall reduce your number of cycles by 4 fold. This explains why your batteries last only 2.5 years rather than the expected 10 years.

Realities

Average lead acid at 1.0C charging



Average Lithium 1.0C charging



Compare the cycles from a lithium battery at 1C charge rate against the more realistic lead acid cycles at 1C. Note the cycle scale on the lithium is 10000 cycle where the lead acid scale is only 1000 cycles, the lithium has approximately 20 times greater life expectancy.

Advanced Alternator Regulators

Pro Reg BW (Waterproof)

Maximum Alternator Rating:

With existing fitted regulator 350A alternator.

With no fitted regulator 150A alternator

Field Rating:

Positive Field Control = 8A maximum field current.

Negative Field Control = 13A maximum field current.

Waterproof IP66 (built to) - as the unit is sealed the longevity of the regulator is significantly enhanced as the circuit board is not exposed to the elements.

8 LED information display

Pro Reg BW Waterproof Advanced alternator regulator

Voltage DC	L x W x D	Weight Kg	Code
12V	120 x 80 x 45	0.4	AR12W



1 x Battery Temp Sensor (TSAY)



2 x Battery Temp Sensor

Pro Reg D

Maximum Alternator Rating:

With existing fitted regulator 600A alternator.

With no fitted regulator 400A alternator

Field Rating:

Positive Field Control = 25A maximum field current.

Negative Field Control = 30A maximum field current.

12V and 24V operation

Fan cooled allows for rating to be the highest of all Sterling regulators.

Pro Reg D Advanced alternator regulator

Voltage DC	L x W x D	Weight Kg	Code
12V & 24V	180 x 90 x 55	0.5	PDAR
Remote control	170 x 90 x 40	0.25	PDARR



2 x Battery Temp Sensor (TSAY)

Pro Reg DW (Waterproof)

Maximum Alternator Rating:

With existing fitted regulator 400A alternator.

With no fitted regulator 200A alternator

Field Rating:

Positive Field Control = 12A maximum field current.

Negative Field Control = 18A maximum field current.

12V and 24V operation

Waterproof IP66 (built to) - as the unit is sealed the longevity of the regulator is significantly enhanced as the circuit board is not exposed to the elements.

15 LED information panel

Pro Reg DW Advanced alternator regulator

Voltage DC	L x W x D	Weight Kg	Code
12V & 24V	160 x 96 x 55	0.58	PDARW
Remote control	170 x 90 x 40	0.25	PDARR

Pro Reg

	BW	D	DW
Digital software control with slow start	●	●	●
Dynamic Progressive battery charging	●	●	●
Can be used in parallel (recommended) or stand alone regulator	●	●	●
Programmable for different battery types	●	●	●
Single unit fits 99% of alternators and all battery types	●	●	●
Charges to 4 step progressive constant current charging curves	●	●	●
Self diagnosing fault system	●	●	●
Totally isolates the advanced regulator in fault condition	●	●	●
Information 6 LED display one tri coloured	●	●	●
Information 8 LED display (B only)	●	●	●
Battery Temperature sensing	●	●	●
High battery temp trip	●	●	●
High battery voltage trip	●	●	●
High alternator voltage trip	●	●	●
De-sulphation ability on open lead acid batteries	●	●	●
In event of failure auto return to standard alternator regulator	●	●	●
Can be used with or without the temperature sensor	●	●	●
Monitors for excessive neg voltage drop and trips	●	●	●
Protects batteries if temperature sensor open circuited	●	●	●
Protects batteries if split charge relay/diode fails open	●	●	●
Protects batteries if advanced reg fails closed	●	●	●
Protects batteries if battery sense wire falls off or broken	●	●	●
10 LED display	●	●	●
13 LED display	●	●	●
12 or 24V operation, selectable	●	●	●
Remote control option	●	●	●
Alternator temperature sensor and boost disengage	●	●	●
Unit thermostatically controlled fan cooling for max performance	●	●	●
IP 66 waterproof & ignition protected for W options	●	●	●

Advanced Regulator features explained in more depth:

Digital software control with slow start:

Digital control (software) means that very complex information and mathematical algorithms can be processed that would not be possible with an analogue hardware system. Unit ramps currents early - prevents alt slip.

Dynamic progressive battery charging: This is a term used to explain that the internal software calculates a different charging regime every time it is used as the battery state is never the same. Older systems simply used fixed trimmers.

Can be used in parallel or as a stand alone regulator: These regulators can be used as stand alone and in parallel with existing regulators. Good practice to leave original regulator in place for fail safe.

Programmable for different battery types: Multiple charging profiles for AGM, Gel and lead acid cells.

Single unit fits 99% of alternators: Manufactures have multiple, we have one.

Charges to 4 step constant current progressive charging curves:

Self diagnosing fault findings:

The regulators scan the system every two seconds and if all the parameters are not within our preset values then the unit will switch 'off' and signal a fault. This is to prevent adverse damage to your batteries.

Totally isolates the regulator in a fault condition:

Sterling's system physically breaks the field wire guaranteeing that the Advanced Regulator will stop working.

Information LED display:

Battery temperature sensing:

One battery temperature sensor is supplied with the unit. This will adjust the output charging curves with the ambient battery temperature.

High battery temperature trip:

Sterling's software will pick up the high temperature and in the worst case of a battery exceeding 50 deg C, will switch 'off' the regulator and display a warning.

High battery voltage trip:

In the event of the battery voltage going too high the unit will switch the regulator 'off' and display a warning.

High alternator voltage trip:

This is the most common trip used. In the event of poor wiring, incorrect installation, or any fault in the system, the alternator voltage will rise too high; the unit will trip out and display a warning.

De-sulphation ability on open lead acid batteries:

In order to prevent and even de-sulphate lead acid batteries a regular charge cycle exceeding 14.4V (x 2 for 24V) will remove the sulphate from a battery bank and so prolong its life expectancy.

In event of failure auto return to standard regulator:

Your standard regulator will automatically take over and allow the journey to continue but at a lower charge rate.

Can be used with or without temperature sensing:

Some people don't want to fit temperature sensors, the choice is yours, the software will pick up if you use it or not and control accordingly.

Protects batteries if temperature sensor open circuited:

A big problem with temperature sensors (why people don't like fitting them) is that they are on a battery. If someone changes the batteries and breaks or open circuits the temperature sensor wire, most Advanced Regulators will destroy your batteries by over charging them. Not so with a Sterling. In the event of a failure of a cable break the Sterling software will pick it up within 2 seconds and return to the default settings and carry on safely. It will also protect batteries if split charge relay/diode fails open circuit.

A common fault when fitting an Advanced Regulator is the old split charge diode or relay that is not up to handling the new performance, resulting in a regulator to fail. This will result in the destruction of the other battery bank, as the battery sense wire will be isolated from the alternator (but not with a Sterling).

Protects batteries if advanced regulator fails:

In the unlikely event of the Advanced Regulator failing then most regulators will fail closed and destroy all your batteries (Sterling software will prevent this from happening).

Alternator temp monitoring and disengagement:

This unit can monitor the alternator temperature and switch off the control unit in the event of high alternator temperature. The Advanced Regulator will automatically re-engage when the alternator cools down.

Thermostatically controlled fan cooling: Pro Reg D only

This is the only fan cooled regulator on the market (as per 2014) and offers the ability to connect this device to massive alternators if required. This unit can deliver field currents up to 20A+. This allows use on alternators way up to 600A plus or to work in extremely high ambient temperatures. We are unable to correctly advise on the maximum performance of this regulator against any large alternators as we have simply been unable to stretch it to its maximum with any alternators we have found to date to run with it.

Warning: for large alternators (120A plus) where the existing regulator is non existent (Bulmar) then we recommend the Pro Reg D as this has fan cooling

Pro Reg Alternator max sizes

Pro Reg B up to 250A with standard reg / 130A stand alone
Pro Reg BW up to 350A with standard reg / 150A stand alone
Pro Reg DW up to 450A with standard reg / 150A stand alone
Pro Reg D up to 600A with standard reg / 400A stand alone

Alternator to Battery Chargers

80A-400A (at 12V) 60A-200A (at 24V)

The Alternator to Battery charger (A2B) connects very simply to an existing alternator(s) and provides extremely fast and effective charge to the domestic/house bank (5+ times faster than a stand alone alternator). The A2B achieves this performance by pulling down the voltage on the alternator by putting a 'load' on it. This low voltage (at high current) is amplified to a 4 stage charging profile at the domestic bank. Due to the A2B's internal splitting system there is the option to charge the starter battery too. The starter does not get advanced charging, it simply gets a sufficient maintenance charge.

Quick and Easy Installation. This charger is effective, simple and fast to install. It transforms the output of the alternator into a sophisticated multi-stage charger resulting in faster and more complete charging of your house / domestic battery bank.

Starter bank and domestic bank charger. This charger has an intelligent integral splitting system. The output is split to the starter bank and to the domestic / house bank. Domestic receives advanced charging.

Multiple alternator inputs. Numerous alternators can be fed to the input of the charger provided the total current rating does not exceed the charger's rating. E.g. 400A charger can handle 4 x 100A alternators.



Largest model
up to 400A (at 12V),
200A (at 24V).

Over 5 times faster charging. This charger optimizes the available output of the alternator and converts it to mimic that of a mains driven 4 stage battery charger. Consequently your batteries will charge faster resulting in less engine hours and a reduction in fuel used. This charger can therefore, pay for itself within a matter of weeks.

No alternator modification required. The charger is fitted between the alternator and battery(s) and, unlike conventional regulators, requires no modification or interference with the alternator whatsoever. This saves on time and bypasses any engine management systems (ECU) or warranty issues.

Not suitable for any modern European vehicle or any vehicle equipped with an advanced ECU. For suitable products - look to the range of Regenerative Braking Friendly devices – the Battery to Battery Charger.

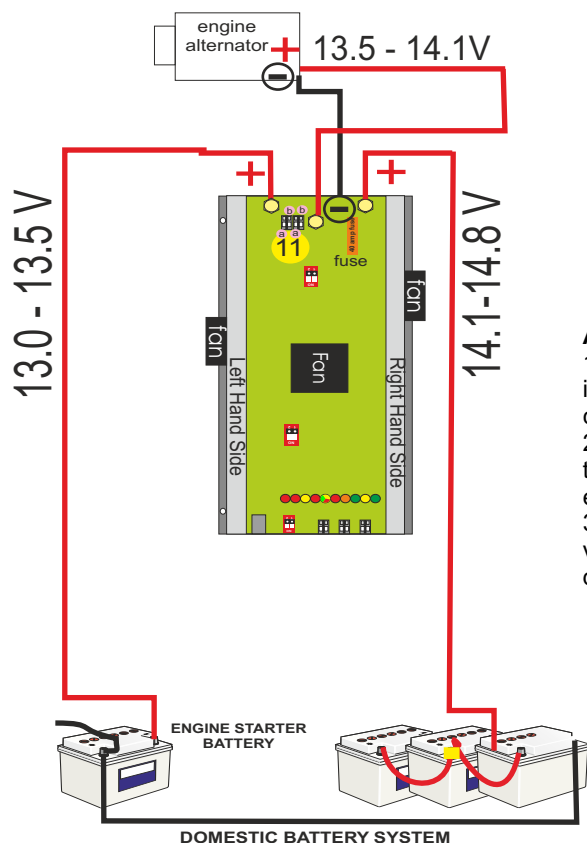
Smallest model
80A - 130A (at 12V).



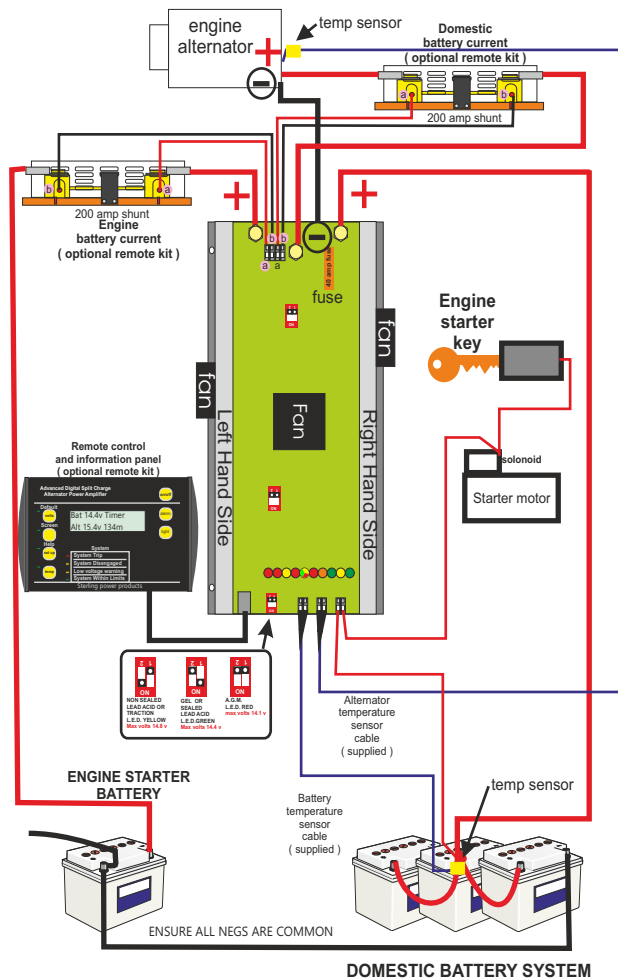
Battery and alternator temperature sensing. The chargers disengage the unit in the event of the alternator temperature getting too high, it then re-engages the unit when the alternator cools down. The same thing happens when the batteries get too hot.

Multiple charging profiles. Chargers have AGM, Gel, Flooded lead acid, sealed lead acid and calcium charging profiles.

System wiring, single or twin alt (minimum, requirement)



Full system wiring single or twin alt (including optional remote kit if used)



Alternator Regulator or Alternator to Battery Charger?

We are frequently asked this question.

For an in depth reason to choose the A2B over the alternator regulator. We recommend that you refer to our FAQ page. Here we shall discuss the main differences, the time it takes to wire up, engine management systems and warranty voiding.

Put simply the Alternator to Battery charger can be more easily and speedily installed, it tends to avoid any engine management issues and shall not void your manufacturers warranty.

Additional features:

- 1) Battery sensor. When DC cables are long a voltage drop can be induced across it. There is a connector which allows for the compensation of this drop.
- 2) Ignition start. Some alternators require a voltage on the alternator to start up. There is a built in device to overcome this problem in the event of such an alternator type being used.
- 3) The remote control. This offers full set-up information, plus voltages and temperatures of all the relevant places, as per the digital alternator regulator.

Optional Remote control for the AB12160/210/24100.

10m of pre-wired link cable and 2 x 200A shunts. Ideal for measuring current. Can be surface, recess or flush mounted.



Optional Remote control for the AB1280/12130/300/400.

10m of pre-wired link cable. Does not measure current.



Alternator to Battery chargers

DC (V)	Max Alt size (A)	L x W x D	Weight Kg	Code
12V	80A	270 x 180 x 80	2.5	AB1280
12V	130A	270 x 180 x 80	2.5	AB12130
12V	300A	370 x 288 x 70	5	AB12300
12V	400A	370 x 288 x 70	5.1	AB12400
24V	80A	270 x 180 x 80	2.5	AB2480
24V	200A	370 x 288 x 70	5.2	AB24200
Remote for above products in Black (no shunts)				ABNRC
12V	160A	250 x 280 x 70	3.5	AB12160
12V	210A	250 x 280 x 70	3.5	AB12210
24V	100A	250 x 280 x 70	3.5	AB24100
Remote for above products in Red inc 2 x 200A shunts				ABRC

Pro Split R

0.0V drop alternator splitting system built to IP65

12V/24V 120A-250A.

Up to 2 alternator inputs and 4 outputs.

The Pro Split R is a 0.0V drop alternator splitting system. It is the successor to the old diode based splitting systems which induced large voltage drops at high current. The newer, much more intelligent, Pro Split R selects a battery bank and isolates the other battery banks to prevent their voltage misleading the alternator's regulator (assuming regulator is connected). This allows the regulator to focus on the correct battery and can maximise the alternator's potential. Then, at a specific level, the other battery banks are charged and finally all charged together. The charging performance can be further enhanced with the use of an **Advanced Alternator Regulator** (see pages 26/27).

Isolates the battery bank(s): The unit isolates when there is any attempt to back feed the power from the full battery bank to a more demanding battery.

Comprehensive L.E.D. display: that shows which channels are in use and which are not.

Micro Processor Controlled: All batteries are charged in conjunction with each other and back feed under high load conditions is prevented. The system also has the ability to disconnect the alternator and individual battery bank outputs in the case of problems caused by the alternator to other devices.

0.01 voltage drop through the current range :

This negligible voltage drop is far superior in performance in comparison to the old diode based splitting systems which suffered from a far greater voltage drop.

Alternator Regulators: The sense stud on the Pro Split R allows seamless integration of Sterling's alternator regulator with this 0.0V splitter resulting in the ultimate split charging device.

Overload Design: The model rated for 180A is actually continually rated for 240A with overload in excess of 2000A.

Backfeed protected:

If there is a defective battery charger on one battery bank trying to back feed into another battery bank, the unit would disconnect that battery bank to save others.

Distributes the most power: to the battery bank which demands it.

Faster Battery Charging: 0.0V drop allows for a much faster charge. Additionally, once the Pro Split R is happy with the charge state of the starter battery the focus of the charge is directed to the larger domestic/house bank. This ensures a one on one charging experience between the alternator and house. N.B. The starter battery is always monitored and then prioritised if needs be.

Isolates the main alternator: If the alternator was to fail, the Pro Split R would isolate all batteries to protect them from over charging (boiling).

Fail-Safe: In the event of unit failure, the engine start battery and alternator remain connected. This ensures the safe running of the boat/vehicle. It prioritizes the engine start battery charging over all other battery bank outputs.

High Safety Elements Built In:

As much safety and control is built in as possible to protect your electrical system and to ensure available power is directed to where it is required most.



Larger Models: The image to the right is of the largest Pro Split R in the range. It handles 2 alternators in and 4 outputs. The outputs include 2 x starter batteries (one on each side) and 2 auxiliary banks. The alternator maximum is 130A at 12V for this model.



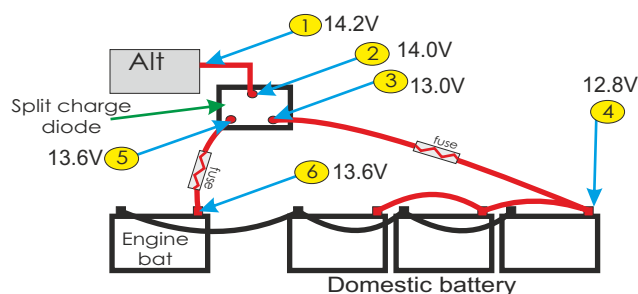
Works with 2 x alternator regulators: Provides a 4 stage charging profile to each of the 4 outputs for super fast charging on all banks.

Not suitable for any modern European vehicle or any vehicle equipped with an advanced ECU. For suitable products look to the range of Regenerative Braking, Friendly, such as the Battery to Battery Charger.

Examples of the problem where the old diode system can potentially be detrimental to both your battery charging rate and your batteries health/longevity.

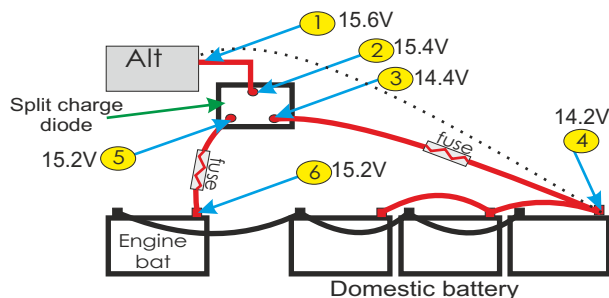
Example 1

Note the 12.8V at the Domestic Battery. This battery shall not receive any charge and shall sulphate. At higher current, the voltage drop across the **diode** is higher.



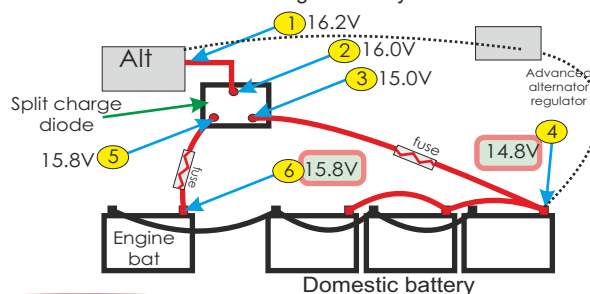
Example 2

This example is with an intelligent regulator fitted. Note the 15.2V at the Engine Battery. This battery shall over charge. Note the 14.2V at the Domestic Battery. This battery shall under charge. At higher current voltage drop across the **diode** is higher.



Example 3

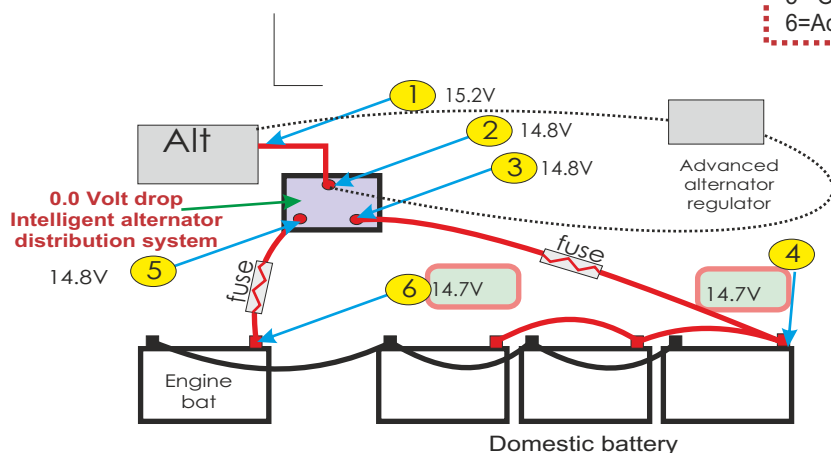
Note the 15.8V at the Engine Battery. This shall boil.



Shared key

- 1= Alternator Voltage
- 2= Input to diode Voltage
- 3=Output diode Voltage to domestic battery
- 4=Voltage at battery terminal
- 5= Output Voltage to engine start battery
- 6=Actual Voltage at engine battery

The Cure. The **Pro Split R** has the cure to the diode based issues.



Example 1

This example is with an intelligent regulator fitted. Note the 14.7V at the Engine Battery. This battery shall charge properly. Note the 14.7V at the Domestic Battery. This battery shall charge properly. At higher current voltage drop across the **Pro Split R** is negligible providing a better charging system.

Pro Split R 0.0 volt drop intelligent splitter						
DC (V)	Max Alt (A)	Battery banks	L x W x D	Weight Kg	Code	
12V	120A	2	150 x 80 x 120	0.6	PSR122	
12V	180A	2	150 x 80 x 140	0.7	PSR182	
12V	250A	2	150 x 80 x 155	0.9	PSR252	
12V	120A	3	150 x 80 x 130	0.9	PSR123	
12V	180A	3	150 x 80 x 150	1	PSR183	
12V	250A	3	150 x 80 x 180	1.3	PSR253	
Twin 12V	2 x 130A	4	150 x 80 x 295	1.8	PSRT134	
24V	60A	2	150 x 80 x 120	1.8	PSR62	
24V	100A	2	150 x 80 x 140	0.6	PSR102	
24V	150A	2	150 x 80 x 165	0.7	PSR152	
24V	240A	2	150 x 80 x 250	1.2	PSR242	
24V	60A	3	150 x 80 x 150	0.7	PSR63	
24V	100A	3	150 x 80 x 175	1	PSR103	
24V	150A	3	150 x 80 x 220	1.3	PSR153	
Twin 24V	2 x 80A	4	150 x 80 x 295	1.8	PSRT84	

Current Limiting Voltage Sensitive Relays

from 70A - 280A 12V/24V

The range of **Current Limiting Voltage Sensitive Relays (CVSRs)** offer bullet proof versatility. Not only do they act as bidirectional 0.0V drop charging relay but they also offer the ability to react in a controlled way to excessive loads that would normal destroy conventional relays. Under high loads, such as: Large Inverters / AC units / Bow Thrusters. The load drawn down the DC cabling would exceed the cable and relay rating and cause the arc to weld shut or would simply cause the relay to shatter. However, the CVSRs have PTC fuses which allow this high load to abate before opening the relay, thus protecting your relay/system.

Built in current limiting: Courtesy of the PTC fuses (red components jutting out of the unit), if overloaded, the product will simply shut off safely so as to protect the relay and the installation. Once the high load demand has been removed the relay is safe to re-engage.

Available in: 70A, 140A, 210A & 280A. 12/24V auto select.

0.0V drop charging relay: 0.01V drop is the voltage drop across the relay. This is a negligible drop allowing for the best charge possible across the relay.

Extremely low quiescent current, approx 1 mA.

6 LED information display. With remote LED option. With 5 built in alarms

Start up time delays: A 30 second start up time delay prevents the relay coming on while the engine is being started, protecting the relay circuit and preventing fuses blowing and damage to the relay.

Uni and Bidirectional charging relay:

IP66 waterproof (built to)

Manual Override: The unit, by default, is voltage sensitive. It requires 13.3V to close circuit and 13.0V to open circuit. A manual override allows the user to dictate when the relay activates. Typical override would be an ignition feed.

Customisable on and off voltages: The voltage at which the relay closes and opens are default at 13.3V (on) and 13.0V (off) - twice for 24V. However, these thresholds can be adjusted.



Current Limiting Voltage Sensitive Relays (adjustable)

DC (V)	Rated (A)	L x W x D mm	Weight Kg	Code
12V & 24V auto	70A	140 x 120 x 40	0.1	CVSR70
12V & 24V auto	140A	140 x 180 x 40	0.2	CVSR140
12V & 24V auto	210A	140 x 210 x 40	0.25	CVSR210
12V & 24V auto	280A	140 x 240 x 40	0.25	CVSR280

IMPORTANT Safety Features

(shared by CVSRs / VSRs and Ignition Fed Relays).

- High overload surge rating.
- Back EMF spark arrester.
- Emergency auxiliary forced activation.
- High battery voltage trip protection.
- Suppression diodes across relay to prolong life.
- SAEJ1171 ignition protected.
- 5 alarm functions and safety trips.
- Protects primary battery from discharge.
- Anti Relay contact arching protection.
- Reverse polarity protected.

Voltage Sensitive and Ignition Fed Relays

Voltage Sensitive Relays Pro Con VSR range (80A-240A) (refer to CVSR page for safety features)

0.0V drop and low quiescent current. The voltage drop is 0.01V allowing for negligible power loss across the relay. The quiescent current is 1mA.

6 LED information display

Automatic voltage activation. True to word the relays are sensitive to voltage. On voltage is 13.3V. Off is 13.0V (x2 for 24V). **This can be manually changed.**

Ignition/signal override is possible to allow for manual override.



High quality brass connections.

Uni and Bidirectional charging relay: Multiple relays can be used to link / isolate as many battery banks as suitable.

Built to IP66 waterproof

Available in: 80A, 160A, 240A
12/24V auto select.

Start up time delays: A 30 second start up time delay prevents the relay coming on while the engine is being started, protecting the relay circuit and preventing fuses blowing and damage to the relay.

Voltage Sensitive Relays (adjustable)				
DC (V)	Rated (A)	Size L x W x D mm	Weight Kg	Code
12 & 24 auto	80	140 x 180 x 40	0.1	VSR80
12 & 24 auto	160	140 x 190 x 40	0.2	VSR160
12 & 24 auto	240	140 x 200 x 40	0.25	VSR240

Additional VSRs



Magnetic Digital VSR: The Digital VSR shares the **same features as the above VSR80-240 range**. It has fewer LEDs but is totally waterproof and ingress proof. This relay requires the use of the magnet to change the relays settings. The largest current rating is 160A.



Voltage Sensitive Relays (adjustable)			
DC (V)	Rated (A)	Weight Kg	Code
12 & 24 auto	80	0.1	VSRB80
12 & 24 auto	160	0.1	VSRB160

Voltage Sensitive Relays (adjustable)			
DC (V)	Rated (A)	Weight Kg	Code
12	80	0.1	VSRA8012
12	160	0.1	VSRA16012
24	80	0.1	VSRA8024
24	160	0.1	VSRA16024

Analogue VSR: The Analogue VSR is the most affordable VSR that Sterling does. It has no adjustable features. The user can not adjust the voltage thresholds and there is no switching delay. The unit is also not 12V / 24V auto select. They are simply 12V or 24V models. The unit has a fixed on voltage of 13.3V and the fixed off voltage of 13.0V. Ignition override is also possible.

Ignition Fed Relays (refer to CVSR page for safety features)

Available in:
12V 80A, 160A & 240A
24V 50A 100A & 150A

Requires Ignition / D+ / Signal feed to operate: This range of low cost signal activated relays are the simplest in the range. It offers the ability to link together as many battery banks as you wish and therefore charge different battery banks on a boat / vehicle when the engine is running.



**IP66 waterproof
(built to)**

Starter battery interlock: This unit has the ability to interlock with up to 2 engines starter motors to ensure the relay is inactive when starter motors are engaged, thus protecting the relay and avoiding fuses blowing.

Ignition / Signal fed Relays				
DC (V)	Rated (A)	Size L x W x D mm	Weight Kg	Code
12	80	140 x 60 x 40	0.025	IFR1280
12	160	140 x 70 x 40	0.030	IFR12160
12	240	140 x 80 x 40	0.030	IFR12240
24	50	140 x 60 x 40	0.025	IFR2450
24	100	140 x 70 x 40	0.030	IFR24100
24	150	140 x 80 x 40	0.030	IFR24150

120A - 200A Ignition Fed relays 12V / 24V

Part No.	R12120	R24120	R12200	R24200
Coil Nominal (V)	12V	24V	12V	24V
Contact Current Rating (A)	120A	120A	200A	200A



Pro Latch R - Latching Relays

80A - 240A Models

The Pro Latch R is a versatile latching relay with 4 major operational modes. The benefit of using a latching style relay over a conventional relay is down to the efficiency of the relays. Conventional relays use up to as much as 0.5A to stay closed circuited. However, the latching relay does not use any current to stay closed. This is ideal for low harvest systems that include wind and solar. The 4 major operational modes are discussed below:

Models:
80A / 160A / 240A
12V and 24V.

More Efficient. Latching relay technology is more efficient than conventional relays as they consume no power to stay closed. The only minor current drawn is via the software (0.5mA).

IP66 Waterproof. The Pro Latch R is built to IP66, which is the highest level of waterproof and ingress proof rating.

Ideal for **Solar** and **Wind** technology. Along with other low harvest energy sources.

Operational Mode 1.
Bidirectional Charging Mode.
This mode allows activation of the Pro Latch R at both sides of the relay - ideal for normal between battery charging. Activation voltages are **on** at 13.3V and **off** at 13.0V.

Operational Mode 2.
Battery Protection Mode.
This mode allow the user to protect the battery from excessive charging and discharging. The **on** voltage is 12.0V and the **off** is 12.3V.

Operational Mode 3.
Engine Start Protect.
This mode allow the user to protect the start battery from discharging beyond a point whereby they can no longer start the engine when cranking. The **on** voltage is 12.6V and the **off** is 12.4V.

Operational Mode 4
Unidirectional Charging Mode.
This mode allows for relay activation on one side of the relay only. Very similar to mode 1 without the bidirectionality. **On** at 13.3V and **off** at 13.0V.

Intelligent switching algorithms.
All operational modes switch the relay between on and off positions. There is a time and history element to when the relay changes position, it not a simple voltage threshold switch. This is designed to prevent unnecessary relay chatter and inefficiencies.

12V or 24V Auto select.
The Pro Latch R's can detect whether you have a 12V or 24V system and shall conduct its operation accordingly.



Remote Control



54mm hole cut

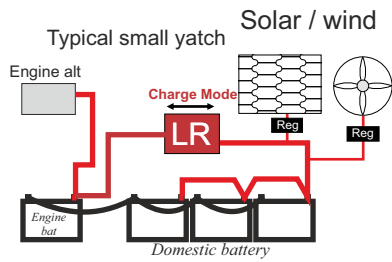
Pro Latch R Remote Control Functions

- 1) Input Voltage.
- 2) Output Voltage.
- 3) Optional waterproof display, encapsulated electronics.
- 4) Various over ride to allow lights to be switched on for safety. (only available with remote).
- 5) Sleep: power saver function.
- 6) Audible alarm stop.
- 7) Audible alarm disconnect.
- 8) Back light option on/off.
- 9) Background light colour change depending on function.
- 10) Relay circuit opened or closed indicator.
- 11) High Voltage trip alarm and low voltage warning.

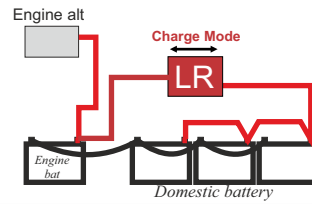
Remote control allows access to all the relevant information, the panel comes complete with a 5 metre telephone type extension lead. The remote is in a standard 54mm threaded housing. This is an optional product and is not required for the operation of the main product.

Examples of common applications for the Pro Latch R

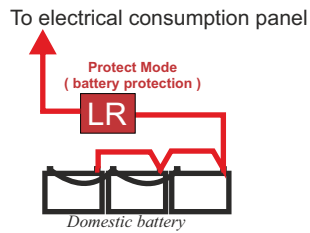
Bidirectional charging relay



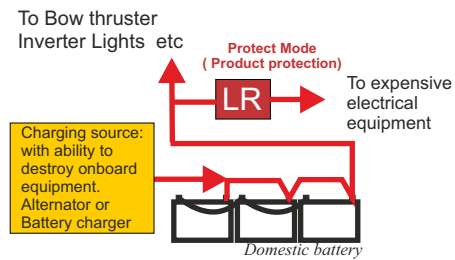
Bidirectional charging relay



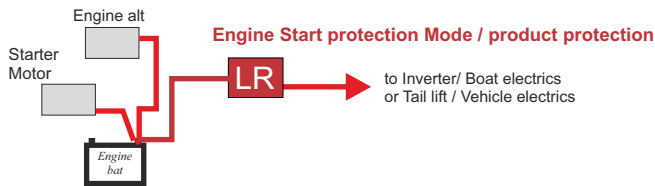
Battery protection



Product protection mode

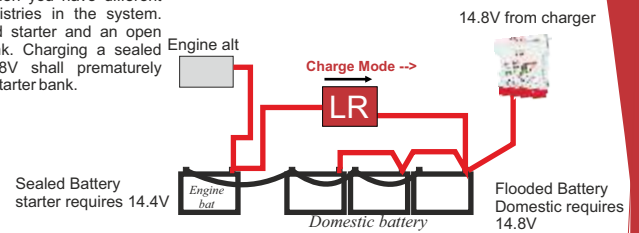


Engine Starter Battery Protection Mode

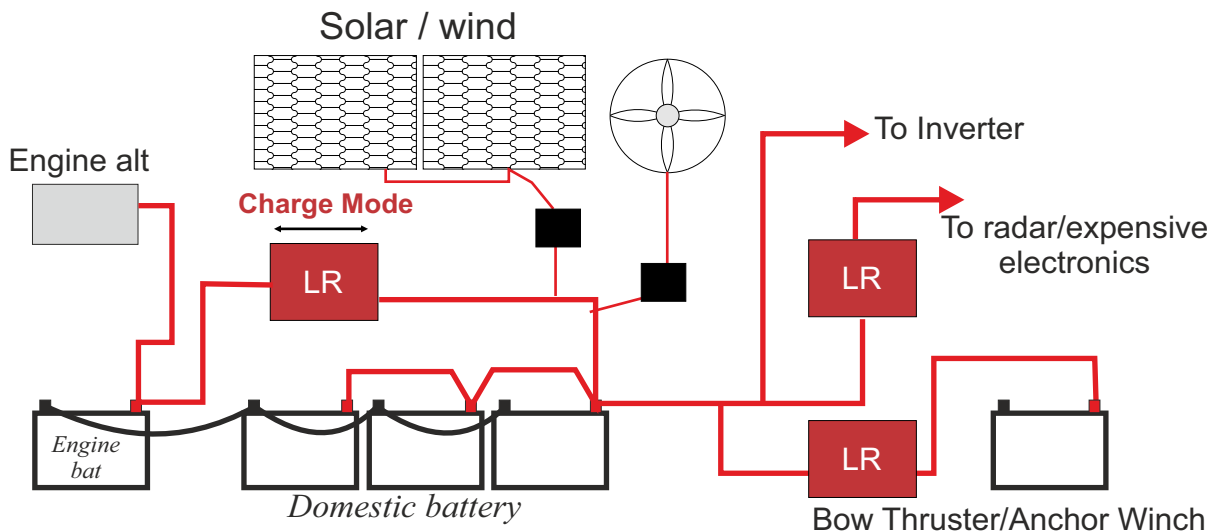


Uni Directional Charging

Sometimes uni directional charging is necessary when you have different battery chemistries in the system. E.g. a sealed starter and an open domestic bank. Charging a sealed bank at 14.8V shall prematurely destroy your starter bank.



Multiple use on small boat



Code	Continuous Current	Max Intermittent Current	Quiescent Current mA	Input Voltage	Output stud	Preset Voltage Battery protect	(can be adjusted if required)		
							Starter Protect	Charging mode	
LR80	80A	500A	0.5	12V/24V auto	6 mm	Off 10.9V on 12.8V	Off 12.4V on 13V	on 13.3 off 12.9	
LR160	160A	1000A	0.5	12V/24V auto	8 mm	Off 10.9V on 12.8V	Off 12.4V on 13V	on 13.3 off 12.9	
LR240	240A	1500A	0.5	12V/24V auto	8 mm	Off 10.9V on 12.8V	Off 12.4V on 13V	on 13.3 off 12.9	
LRB80	80A	500A	0.5	B = Budget: Relay only available with a fixed/non adjustable factory setting, non-programmable					

LRR Latching relay remote with 5 metres of cable, for longer use standard telephone cable extension.

Electrical Latching Isolation Switches

160 - 640A Models

Electrical Latching Battery isolation switches (ELBs) are used to completely isolate a battery bank to prevent any unwanted current drain from taking place. Typically users want to cut leaking from their starting system and from their appliance system. The key features to look for when selection ELBs are: Continuous rating (A), overload rating (A) and then the current draw when the ELB is on and off. Sterling's ELBs excel in all these key features. Built to **IP66**.

160A - 640A Latching circuit rating: The products rating are their continuous rating. Work out what the continuous load shall be in order to rate the ELB to the correct specification.

The battery powering the ELB does not have to be the battery that you wish to isolate.

Up to 50V for the latching circuit: The latching circuit is fine for voltage ratings up to 50V.

The latching circuit and the control circuit are isolated. This is extremely important and means that the unit can latch on the **negative** or the **positive** of the battery that you wish.

Latching relay technology uses no current to stay closed or opened circuited. This means latching relays will not consume current from your system when turned on or off. The switching consumption does use current - about 2A for 0.5 seconds.

D+ alternator ignition feed safety interlock circuit: If the latch position changes when the alternator is running damage can befall the engine/alternator. To prevent this, a signal override system has been installed. This signal (D+/61/ ign feed) will prevent the switch position changing. Only when the signal has abated (engine turned off) will the latching relay switch.

Cold cranking / engine start: The ELBs can handle 1500A-6000A over 5 seconds and 600A to 2400A over a 30 second cranking period (model dependent).

The control circuit is powered by either 12V (low as 8V) or 24V (low as 16V). Due to the low instantaneous power consumption of the controlling circuit you can tap the voltage off a larger bank 36V / 48V bank.

8mm studs ensure good contact for electrical cables.

160A and 240A models

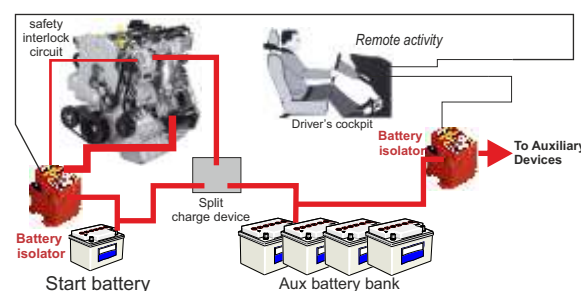
480A and 640A models



Supplied
3 way rocker
switch with
Blue LED



Optional
key lock switch



Intermittent

Electrical Battery Isolator

Continuous rating:	30 sec	Starter rating	LWD mm	Weight Kg	Cont (A)	Control V	Code
160A	300A	Not suitable starter	90x90x80	0.2	0	12V	ELB12160
160A	300A	Not suitable starter	90x90x80	0.2	0	24V	ELB24160
240A	450A	Car/small van	90x90x80	0.2	0	12V	ELB12240
240A	450A	Car/small van	90x90x80	0.2	0	24V	ELB24240
480A **	1000A	lorry, up to 600hp	150x100x120	0.4	0	12V	ELB12480
480A **	1000A	lorry, up to 600hp	150x100x120	0.4	0	24V	ELB24480
640A **	1300A	lorry, up to 1000hp	150x100x120	0.4	0	12V	ELB12640
640A **	1300A	lorry, up to 1000hp	150x100x120	0.4	0	24V	ELB24640

Extra momentary switch (one supplied standard in each kit)

Key operated switch with 2 keys (optional extra) N.B only momentary switches can be used

ELS1

ELKS1

Split Charge Diodes

70A - 200A Models

Recommended to be used in conjunction with an advanced alternator regulator

Sterling power has developed a range of low cost split charge diodes, they benefit from enhanced performance over conventional diodes and at a lower cost.

All other split charge diode manufacturers use conventional alternator diodes which, at a low current flow have about a 0.93V drop.

70-200A rating. 2-3 outputs.
Relative low voltage drop for diode splitting category.

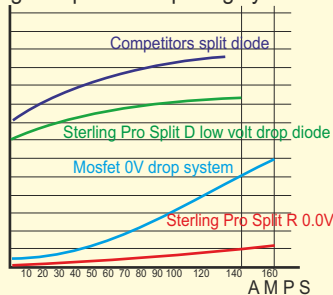
Over coming voltage drop (0.8V - 1.2V). You can attempt to over come voltage drop across the Pro Split D by using a **Sterling Alternator Regulator**. This shall ensure that the battery bank of designate charge get its correct charging profile.



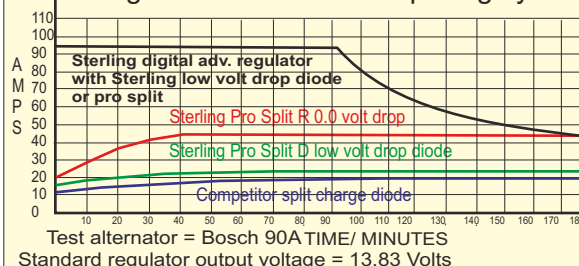
When the full rated current of these diodes is approached the voltage drop increases to around 0.95V. This results in excessive heat and power loss across the diode.

For improved charging and intelligent charging look at Sterling's **Pro Split R and Alternator to Battery Chargers**.

Voltage drop across splitting systems



Charge rate with different splitting systems



Low voltage drop split charge diodes

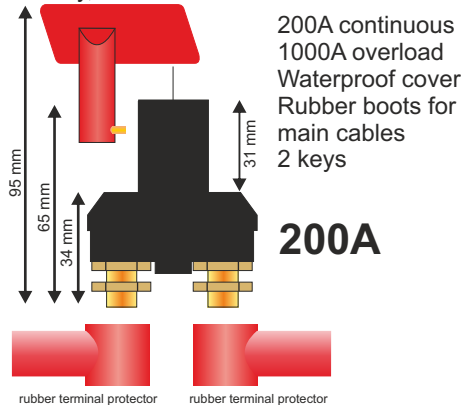
Alternator inputs	Battery banks	Max Alt (A)	Code
1	2	70	D70A2
1	3	70	D70A3
1	2	90	D90A2
1	3	90	D90A3
1	2	130	D130A2
1	3	130	D130A3
1	2	160	D160A2
1	3	160	D160A3
1	2	200	D200A2
1	3	200	D200A3

	Conventional Splitters				Sterling's Pro Split D			
AMPS PASSED (A)	30	50	60	70	30	50	60	70
VOLTAGE DROP (V)	0.93	0.95	0.97	1.1	0.78	0.75	0.74	0.74
POWER LOSS (W)	27.9	47.5	58.2	77	23.4	37.5	44.4	51.8

DC Isolation Switches

Key Features:

Spare Key, Cover seal for switch



200A continuous
1000A overload
Waterproof cover
Rubber boots for main cables
2 keys

200A

300A continuous
2000A overload
10mm studs
Non removable handle



300A

500A continuous
4000A overload
Lockable, Includes 2 keys, 10mm studs
Non removable handle



Key lock in off position only. Key can only be removed in off position

500A

200 Amp Battery Isolator Pro Isolator

DC (A)	Weight Kg	Code
200A	0.1	IS200

300 Amp Battery Isolator Pro Isolator

DC (A)	Weight Kg	Code
300A	0.3	IS300

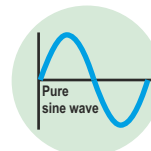
500 Amp Battery Isolator Pro Isolator

DC (A)	Weight Kg	Code
500A	0.35	IS500K

NEW

Pro Combi S+

Combi Inverter Charger



The Pro Combi S+ is Sterling's new inverter charger. It is a bespoke unit that has an attractive new design. The unit is lighter, smaller, yet more powerful than its predecessor. New splash proof design offering some protection against the odd water spill. The Combi S+ also comes with an auxiliary charging output to allow the user to charge their starter battery whilst bulk charging their main battery bank. The auxiliary charging is simply a module that can be installed and allows the user to charge 12V from a 12V or 24V from a 24V or even a combination of them as it is simply a module (e.g. 12V from a 24V unit), unit built to **IP22**.

8 Battery type selectors. All with their own 4 stage charging profiles.

Remote control panel included. The remote is removable and can be replaced with a blank panel. The switch panel can then be remotely mounted using the supplied extension lead (10 meters).

Battery Charger only select option. Allows unit to be set, so in event of shore power failure the inverter does not engage.

Features a power saver function and battery charger power reduction. Great for smaller power supplies and gensets.

12V and 24V models

Neutral - Earth bonding link when on inverter mode to comply with latest regulations. This allows RCD breakers to work.

30A automatic crossover switch: If shore power is connected to the combi the unit allows you to run your appliances directly from the shore power. However, when shore power is disconnected, the unit transfers the load from shore power to inverter power in less than 20ms, ensuring a smooth uninterruptible power supply.

Sterling Power's Combi S+ range of Inverter / Chargers are new to 2016. They arrive in a bespoke and attractive waterproof enclosure (IP55).



Designed to IP22

New, lighter and smaller unit. Refer to the weights and dimensions in the table below. No extra length attributed to end cover caps etc as all AC and DC connectors are now neatly integrated into the unit.

The additional 5A auxiliary charging output port is a new feature of the S+ model. It allows the user to charge the starter battery (example). Also, you can pick and mix. For example, have a 12V main unit with a 24V output port, or vice versa.

Picture of 1600W model

The Battery chargers across the range are larger in current rating. 70A at 12V - 35A for 24V.

Extremely low quiescent current
From 0.1A with power saver on.
0.5A with power saver off.

Power Factor Corrected (PFC)
This unit delivers a unity (0.99) power factor.

DC Voltage (V)	Nominal VA	Continuous		Dimensions		
		Power @ 20degC (W)	Charger (A)	(L x W x D) mm	Weight (Kg)	Code
12	1600	1300	70	225 x 205 x 230	8.5	PCSP121600
24	1600	1300	35	225 x 205 x 230	8.5	PCSP241600
Auxiliary Charge Module 12V or 24V Combi to 12V Battery			5A			ACM12
Auxiliary Charge Module 12V Combi to 24V Battery			3A			ACM1224
Auxiliary Charge Module 12V Combi to 24V Battery			3A			ACM2424

Pro Combi S

Online Current consumption as low as 1.4A. Now fitted with new TX transformer results in 50% less quiescent current.

Familiarity - we have had this Combi style for 10 years. It is proven and ubiquitous.



Battery Charger sizes 40A - 100A (at 12V)

2500W | 3500W models

Pro Combi S Pure Sine Wave 230V 50Hz Euro Standard

DC (V)	Power (W)	Charger (A)	Code
12V	2500W	80A	PCS122500
12V	3500W	100A	PCS123500
24V	2500W	35A	PCS242500
24V	3500W	50A	PCS243500

Pro Combi S Pure Sine Wave 110V 60Hz USA Standard

DC (V)	Power (W)	Charger (A)	Code
12V	2500W	80A	UPCS122500
12V	3500W	100A	UPCS123500
24V	2500W	35A	UPCS242500
24V	3500W	50A	UPCS243500

To make the choice even simpler we have 6 months exchange/upgrade policy. If you purchase the incorrect Combi and find there is some equipment that you cannot use, Sterling are happy to upgrade your unit for another with the only cost being the difference between the 2 products (the unit must be sent direct to Sterling and in good condition and postage paid for by customer). Offer applies dealing direct to the Sterling factory only.

Charger power reduction. Large chargers on Combis often require too much AC power from gensets. The Combi S2 allows the user to reduce the charger's power consumption to within the rating of the genset/AC supply.

Remote control panel included. The remote is removable and can be replaced with a blank panel. The switch panel can then be remotely mounted using the supplied extension lead (10 meters).

8 Battery type selectors.

All with their own 4 stage charging profiles. Custom set also available from panel, no computer required

Sterling Power's Combi S2 range of Inverter / Chargers are new to 2017. They arrive in a bespoke and attractive waterproof enclosure (IP55).

The additional 5A auxiliary charging output port is a new feature of the S+ model. It allows the user to charge the starter battery (example). Also, you can pick and mix. For example, have a 12V main unit with a 24V output port, or vice versa.

New, lighter and smaller unit. Refer to the weights and dimensions in the table below. no extra length attributed to end cover caps etc as all AC and DC connectors are now neatly integrated into the unit.

32A automatic crossover switch: using latching relays which do not consume power. If shore power is connected to the Combi the unit allows you to run your appliances directly from the shore power. However, when shore power is disconnected, the unit transfers the load from shore power to inverter power in less than 20ms. This ensures a smooth uninterruptible power supply.

Low Quiescent current consumption.

using transformer switching algorithms. Combis use current to produce power, even with no loads attached. A typical 12V 2500W Combi would use between 1.5-5A just to stay on and more for a 12V 3500W model. This is due to the flux requirements of the transformer. To run something like a 20W phone charger could consumer up to 80W from the battery. This is unacceptable. On our new units, on power saver mode, we have managed to get the quiescent current down to about 0.7A=8W. The phone charger, now, shall only consume 28W from the battery.

AC power timer. This feature enables the user to turn the inverter on for a set time - user sets 30 minute intervals (up to 5 hours). This is ideal as it allows the user to charge phones / tablets / laptops for a particular time and the inverter then turns off and consumes no current. E.g. Peoples' mobile phones may require 1 hour of charge whilst in bed, so you

Multiple power saver functions.

To preserve battery current we have devised 3 types of power saving functions - this allows the user to pick which one best suits their needs.

Designed to IP22



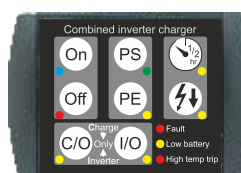
The Battery chargers across the range are larger in current rating. 130A->200A at 12V. 60-100A for 24V.

24 LED information display

Neutral -Earth bonding link when on inverter mode to comply with latest regulations. This allows RCD breakers to work.

Power Factor Corrected (PFC). This unit delivers a unity (0.99) power factor.

Battery Charger only select option. Allows unit to be set, so in event of shore power failure the inverter does not engage.



Remote Control w/ 10m cable

PS = Power Saver select
PE = Power Eco select
1/2hr = Power timer select
⚡ = Charger power reduction
C/O = Charger Only
I/O = Inverter Only
Fault | Low battery | High temp LEDs

Continuous				Dimensions			Code
DC Voltage (V)	Nominal VA	Power @ 20degC (W)	Charger (A)	(L x W x D) mm	Weight (Kg)		
12	3200	2600	130	400 x 205 x 230	15.0		PC2S123200
24	3200	2600	60	400 x 205 x 230	15.0		PC2S243200
12	5000	3900	200	590 x 205 x 230	21.0		PC2S125000
24	5000	3900	100	590 x 205 x 230	21.0		PC2S245000
12V Combi to 12V battery 5A				Auxiliary Charge Module (ACM)			ACM12
12V Combi to 24V battery 3A				Auxiliary Charge Module (ACM)			ACM1224
24V Combi to 24V battery 3A				Auxiliary Charge Module (ACM)			ACM2424

Pro Power Q - Quasi Sine Wave Inverters

100W - 5000W

Pro Power Q are Sterling's range of quasi / modified sine wave inverters. Quasi sine wave inverters work with most electrical appliances, including: hair dryers, phone, computer chargers, microwaves, kettles etc. Exceptions to this are appliances which are thyristor controlled, for example, washing machines or bread makers. **It's the responsibility off the buyer to ensure that any products to be used on Quasi sine wave inverters is rated to do so. Some products do not work and can be damaged with this wave form.**

Cost Effective: Works out at around half the price of the Pure Sine Wave inverter. Yet it works with around 95% of electrical products.

Quasi sine wave

230V 50Hz and 110V 50Hz. UK / Europe domestic use and building site use Europe, and 110V 50Hz for building sites.

The new turbo can inverter. Can lie flat or fits in standard cup holders in cars, lorries vans etc.



350W



600W



1800W



800W

Come with 24Kt gold plated connectors

All inverters come pre-wired.

Relatively small footprint for the power size.

Quiet operation due to new larger fan.

Universal sockets available on some products.



100W - 200W

e13 Automotive type approval

1800W - 2500W



1800W 110V 50Hz

110V / 50Hz models come with yellow sockets, remote control and engine interlock.



2500W 110V 50Hz

110V / 50Hz yellow sockets / remote control / engine interlock						
Socket Type	DC (V)	Power (W)	Size LxWxD mm	Weight (Kg)	Code	
Yellow 16A	12V	1800W	310 x 250 x 100	2	AI21800	
Yellow 2x16A	12V	2500W	420 x 250 x 250	4	AI22500	
Yellow 16A	24V	1800W	310 x 250 x 100	2	AI241800	
Yellow 2x16A	24V	2500W	420 x 250 x 250	4	AI242500	

230V 50Hz 12V DC Quasi Sine Wave Inverters					
Socket Type	DC (V)	Power (W)	Size LxWxD mm	Weight (Kg)	Code
Universal	12V	100W	145L x 65 dia.	0.2	I12100
Universal	12V	150W	145L x 100 dia.	0.3	I12150
British / Euro	12V	150W	145L x 100 dia.	0.3	I12150CT
Universal	12V	200W	145L x 65 dia.	0.3	I12170T
British / Euro	12V	350W	150 x 150 x 65	1.0	I12350
British / Euro	12V	600W	230 x 150 x 65	1.3	I12600
British / Euro	12V	800W	270 x 150 x 65	1.8	I12800
1000-2700W Inc Remote control and 5 metres of cable					
British / Euro	12V	1000W	240 x 250 x 100	2.0	I121000
British / Euro	12V	1800W	300 x 250 x 100	4.0	I121800
British / Euro	12V	2700W	370 x 250 x 100	5.0	I122700
British / Euro	12V	4000W	700 x 250 x 250	10.0	I124000
British / Euro	12V	5000W	700 x 250 x 250	10.0	I125000

230V 50Hz 24V DC Quasi Sine Wave Inverters					
Socket Type	DC (V)	Power (W)	Size LxWxD mm	Weight (Kg)	Code
Universal	24V	100W	145L x 65 dia.	0.2	I24100
Universal	24V	150W	145L x 100 dia.	0.3	I24150
British / Euro	24V	150W	145L x 100 dia.	0.3	I24150CT
Universal	24V	200W	145L x 65 dia.	0.3	I24170T
British / Euro	24V	350W	150 x 150 x 65	1.0	I24350
British / Euro	24V	600W	230 x 150 x 65	1.3	I24600
British / Euro	24V	800W	270 x 150 x 65	1.8	I24800
1000-2700W Inc Remote control and 5 metres of cable					
British / Euro	24V	1000W	240 x 250 x 100	2.0	I241000
British / Euro	24V	1800W	300 x 250 x 100	4.0	I241800
British / Euro	24V	2700W	370 x 250 x 100	5.0	I242700
British / Euro	24V	4000W	700 x 250 x 250	10.0	I244000
British / Euro	24V	5000W	700 x 250 x 250	10.0	I245000



1000W-2700W models include a remote control with 10 metres of cable. Code: **SWR**

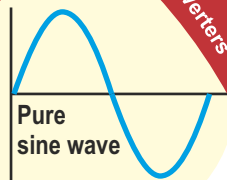
Pro Power SB (R)

Pure Sine Wave Inverters with USB and RCD Version

200W-5000W

Pure Sine Wave Inverters. Replicates true shore power, suitable for all appliances.

- With Twin Socket or built in RCD.
- **Neutral Earth Bonding.**
- **DC cables supplied on 200W - 600W models.**
- **No DC cables supplied on 1000W - 5000W models.**



**230V / 50Hz
200W - 1600W
RCD optional**



**230V / 50Hz
3000W - 5000W
inc built in RCD**

e8



Option 1
Twin socket - Euro (Schuko) + UK.
USB 2A/5V



Option 2
Pre-wired RCD w/ 1m AC cable.
USB 2A/5V



110V / 50Hz Yellow Socket for site use
12V / 24V 1600W models.



Optional remote control
with 5 metres of cable.



4 Digit display:
1) Power - Wattage
2) Voltage



110V 50Hz Model

230V Pure Sine Wave 50 Hz AC inverters 12V DC and 24V DC 200W - 1600W					
Voltage	Power	Weight	Size L x W x Dmm	Cables	Code
12V	200W	1.4Kg	210x190x85	1m Cig Plug	SIB12200
12V	300W	1.4Kg	210x190x85	1m DC 8mm ring	SIB12300
12V	600W	2.0Kg	250x190x85	1m DC 8mm ring	SIB12600
12V	1000W	2.2Kg	300x190x85	8mm connection	SIB121000
12V	1600W	3.6Kg	300x190x85	8mm connection	SIB121600
24V	200W	1.4Kg	210x190x85	1m Cig Plug	SIB24200
24V	300W	1.4Kg	210x190x85	1m DC 8mm ring	SIB24300
24V	600W	2.0Kg	250x190x85	1m DC 8mm ring	SIB24600
24V	1000W	2.2Kg	300x190x85	8mm connection	SIB241000
24V	1600W	3.6Kg	300x190x85	8mm connection	SIB241600
Option 2 Pre-Fitted with RCD and with 1 meter AC cable					
12V	300W	1.5Kg	250x190x85	6mm connection	SIBR12300
12V	600W	1.8Kg	360x190x85	6mm connection	SIBR12600
12V	1000W	2.0Kg	300x190x85	8mm connection	SIBR121000
12V	1600W	3.6Kg	300x190x85	8mm connection	SIBR121600
24V	300W	1.5Kg	250x190x85	6mm connection	SIBR24300
24V	600W	1.8Kg	360x190x85	6mm connection	SIBR24600
24V	1000W	2.0Kg	300x190x85	8mm connection	SIBR241000
24V	1600W	3.6Kg	300x190x85	8mm connection	SIBR241600
230V Pure Sine Wave 50 Hz AC inverters w/ RCD 12V DC and 24V DC 3000W - 5000W					
12V	3000W	6.2Kg	450x256x185	No Cables	SIB123000
12V	4000W	7.0Kg	550x256x185	No Cables	SIB124000
12V	5000W	7.6Kg	550x256x185	No Cables	SIB125000
24V	3000W	6.2Kg	450x256x185	No Cables	SIB243000
24V	4000W	7.0Kg	550x256x185	No Cables	SIB244000
24V	5000W	7.6Kg	550x256x185	No Cables	SIB245000
110V / 50Hz model 1600W with Yellow Socket					
12V	1600W	3.6Kg	300x190x85	8mm connection	ASIB121600
24V	1600W	3.6Kg	300x190x85	8mm connection	ASIB241600
Remote control (fits all models)			90x60x20	5 metre	SWR

AC Auto / Manual Crossover Switches

Pro Switch 32 - AC Automatic Switch 230V/110V-32A

The **Pro Switch 32** is a 3 input 32A automatic crossover switch. It is designed to enable the user to connect 3 sources of AC to a central box (Pro Switch). The output of the Pro Switch is then intended to be directed to your ring mains. The 3 sources could be from shore power, an inverter and a generator. The Pro Switch prioritises the 1st input (typically shore power). It will then automatically switch to the neighbouring inputs when required.

3 Channel Sequential Switching.

Channel 1 is priority (typically shore power). Channel 2 is typically a generator. Channel 3 is typically an inverter. If the inverter and/or generator is connected along with shore power, shore power is priority.

32A Internal Switch.

Switches live and neutral with a 0.5 sec time delay to prevent wave doubling of the voltage and destroying sensitive equipment.

Remote on/off:

This switch enables the shore power to be switched 'off' in the event of it not being powerful enough so that the more powerful inverter or onboard generator could do the job.

Shore Supply AC

Up to 7000W continuous 32A, 230V AC

Generator AC

Up to 7000W continuous 32A, 230V AC. 10 sec delay on the start up to allow generator stabilization before engaging gen set (on gen set channel only)

Inverter AC

Up to 7000W continuous 32A, 230V AC.

230V or 110V AC.

Either voltage scale can be used and can be mixed.

Multiple internal power sources.

The Pro Switch powers itself from the connect AC supplies not from the DC batteries.

Other Features:

Includes a 10s time delay on the generator line to all generator start up.

Faults / Reverse Polarity check:

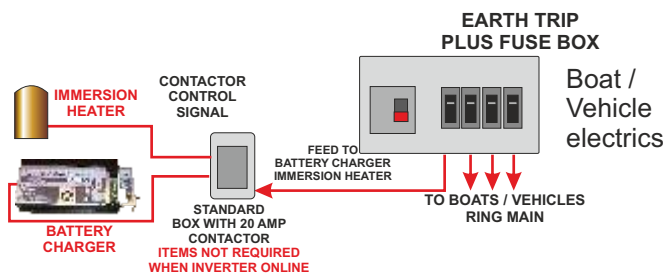
The unit will show if there is reverse polarity on channel '1' which is assumed to be the shore supply system.

Pro Switch 32A 110-230V AC Auto Crossover

Description	Code
Main control box	AC32A
Extra 230V / 20A contact relay	CON1



Optional 230V/20A Contact Relay



Manual 16A/30A/50A 3 way crossover switch

Ideal where 3 power sources are used such as inverters, shore power and generator on a boat / vehicle

Easy to use
Easy to install
Front panel waterproof



Supplied with 2 shafts for thin panel mounting and 1/2 panel mounting.

Manual 230V Crossover Switches

Input sources	Output	Continuous (A)	Max Voltage (V)	Number of poles	Code
3	1	16	300	3	SC16A
3	1	32	300	3	SC32A
3	1	50	300	3	SC50A

High Voltage Protection Device

6KW direct, unlimited power indirect

Sterling's High Voltage Protection Device (HVPD) is designed to protect any 230V AC supply such as: Generators / inverters / mains from incorrect voltage destruction. At some marinas / parks the mains supply voltage is wrong and this can result in the governor speed control / regulator / voltage controller failing (sticking). This can result in a dangerous situation for the operator and can destroy AC equipment. The HVPD is designed to prevent such destructions.

Suitable for generators and inverters up to 6KW with direct connection.

Built to IP66

Suitable for generators and inverters of **any size** with indirect connection.

Automatically sends signal to shut down the actual generator or isolate the inverter, if required.

LED fault indicators

Test setting to confirm all is working.

unit can be adjusted to 270 / 280 / 300V AC. Detects a high voltage which can be adjusted to your requirements depending on the generator being used and its standard reaction to normal on / off loading.

Extra signal port for telemetry system information transmission if required.

Reacts within 0.12 seconds to that set voltage.

If generator is over 6KW the power is disconnected by sending an external signal to a larger breaker to disconnect the main power.

Please note, this is a high voltage safety trip and not an in line voltage conditioner.

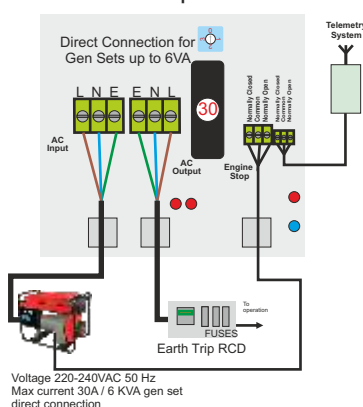
The unit makes no attempt to smooth or fix the high voltage. It is designed to assume a catastrophic failure and switch everything it can off as fast as possible. This reduces / prevents the ensuing damage from that high voltage failure.

If the generator is under 6KW the power is disconnected directly by switching its own 30A power breaker.

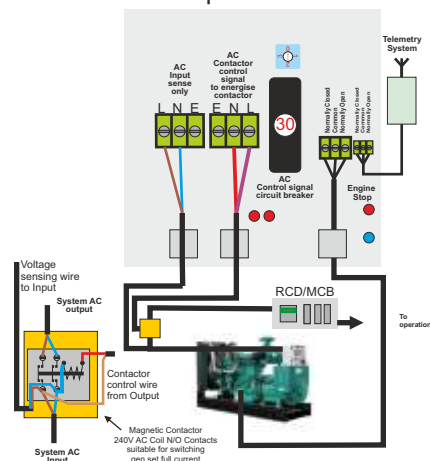
30A overload trip (for internal wiring protection)

SKU	Size L x W x D mm	Weight KG
HVPD	155 x 170 x 118	1.0

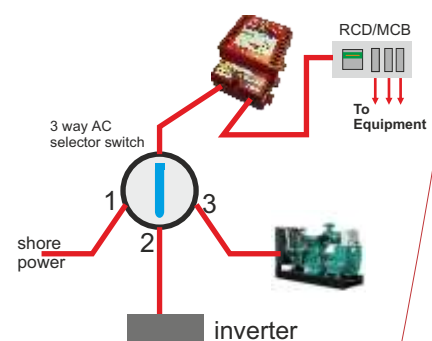
6KVA direct protection



Unlimited power indirect



Multi product use covering Gen sets / Inverters / Mains



Power Management Panel

Up to 400A continuous, 1000A overload.

The power management panel (PMP) is designed to display all the vital electrical information on an average boat. This enables important decisions to be made regarding faults and general onboard DC electrical power management. The information obtained also helps any third party engineer to identify problems.

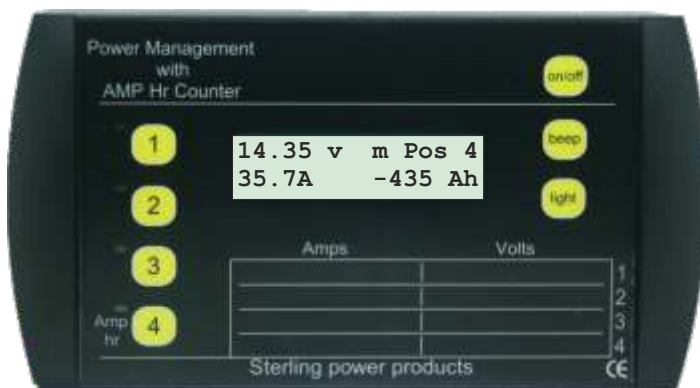
4 comprehensive channels.

Comprised of 4 voltmeters and 4 ammeters. There is one channel dedicated to Ah reading.

Built in Ah counter. This allows the user to measure the capacity remaining in their respective bank. Totally automated function - no user intervention required.

Background light for perfect legibility in day and night times.

Each panel comes with a 200A /100mV shunt. (up to 3 extra shunts may be purchased) and a list of labels for the panel front.



Shunts can be connected to positive or negative cables.

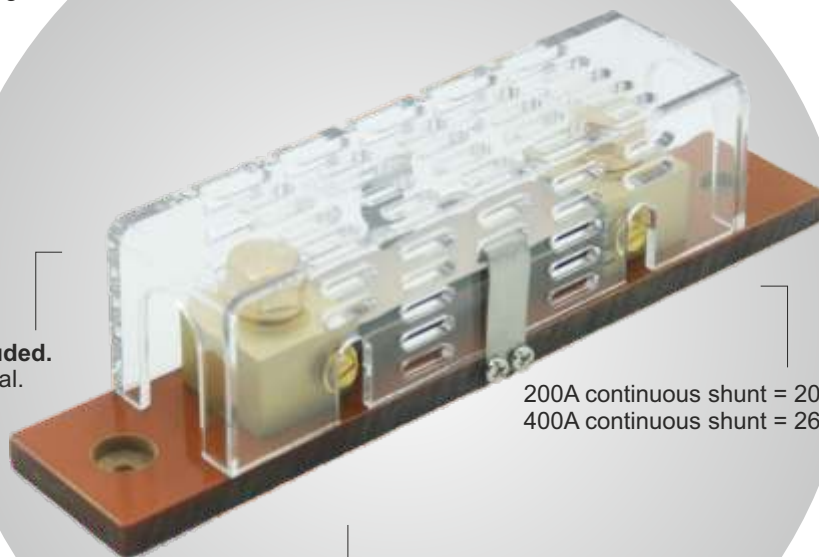
Each panel comes with one 200A /100mV shunt. Additional shunts can be purchased along with a list of labels for the panel front.

The panel can either be surface or flush mounted.

100mV shunts enable all current measurements to take place remotely from the instrument clusters, removing all the voltage drop and RFI problems associated with running heavy duty cables up to a control panel and navigation instruments.

Shunt size:

200A shunt is ideal for 2000W / 24V inverters.
400A shunts are ideal for 4000W / 12V inverters.
The shunts have a very high instant load ability which makes them fine for cranking ~1000A.



200A Brass shunt included.
400A Brass shunt optional.

200A continuous shunt = 200mm x 40mm x 50mm
400A continuous shunt = 260mm x 55mm x 50mm

Power Consumption = 0.5 mA off/0.7 mA on.
Max readable current = 199 A DC.
Safe to over 1000A surges.
LED Background light.
Ah rated up to 7999 A.
Screen = 16 digit 2 line LCD.
Back light / switched.
Accuracy = + or - 1%.

Power Management Panel			
Voltage (V)	Size L x W x D mm	Weight Kg	Code
12V & 24V	170 x 90 x 40	0.25	PMP1
Extra 200A shunt			S200A
Extra 400A shunt			S400A

DC Clamp Meter (ammeter)	
Dimensions	160mm x 35mm x 25mm
Weight	100g
Electrical Specification:	Meets IEC 1010 CAT111
DC voltage	0-200V overload protection 600V
AC voltage	0-500V overload protection 600V
DC current	0-600A overload protection
AC current	0-600A overload protection
Resistance	0-200 ohms overload protection 400
AC frequency response	40-400 Hz
AC speck tested on sine wave	50/60 Hz
Compact yet heavy duty	
Continuity beeper	
Data hold function	



Code
CLAMP1

DC Voltage Probe & Diagnostic Tool	
Available voltages	12V / 24V
Battery Condition Reading	Low 11.5V / 50% 12.0V / Full 25.2V (24V x 2)
Charger / Alternator output	13.2V (min) / 14.5V (max) / 15.5V (over volt) (24V x 2)
Weight	250g
Unique to Sterling Power	



Code
TM12V 12V
TM24V 24V

Wind Up Multimeter (no battery)	
Winding	Wind twice for 2mins use, wind for 10s for 10 mins
Display	46 mm x 23 mm large LCD
Measurement	AC, ACA, DCV, DCA, Ohms, continuity beeper, Hz, %, Cap
Dimensions	152 x 78 x 45 mm
Weight	350g
DC voltage	Range Volts 400.0 mV - 1000V DC Accuracy +/- (1% + 3d)
Input impedance	10 M Ohm
DC current measure	400mA - 10A
Ohms	400-40 M ohm
Capacitance	40nF-100 mF
Frequency	4 Hz - 4 MHz
Diode	(forward voltage , VF)
Range	4 V DC
Resolution	0.001 V
Test voltage	1.6V DC
Test current	1 +/- 0.6 amps
Includes red and black test leads plus instruction manual	
Continuity Beeper	
Overload Protection Fuse	
Beeper if resistance less than 100 ohm	
response time < 100 m	
Range selection Auto ranging w/ manual selecting.	
Data hold to freeze the display reading	



Code
WUVM

Digital Battery Tester

Includes alternator and starter motor tests



Code
DBT125

What does the tester do?

To properly test a battery you need to test the voltage of it under a heavy load. This is what the Digital Battery Tester (DBT) does. The DBT puts a 125A load on the 12V battery for 10 seconds. It measures the rate of recovery of the battery's voltage after the load has abated. The faster the recovery the healthier the battery. Superb device for measure battery condition.

10s Load test	125A
Voltage	12V (for 24/36V center tap)
Battery CCA rating	200-1000A
Battery Ah rating	30-140Ah
Indications	good / weak / bad / sulphation extent
Battery Voltmeter	yes
High Voltage trip	13V
Time between loads	120 seconds
Uses	Batteries, Alternators, Starter Motors
DC Cable length	530mm
Size (LWD)	280mm x 100mm x 120mm
Weight	1.1 Kg

The load test. Depending on the size of the battery, this product adds a very high load to the battery (125 A). The battery should be able to deliver this load and hold the voltage up at the same time. If the battery is unable to deliver the load (and sustain it for this time frame) then the battery is either defective or simply not fully charged when the test was performed. This is why it is crucial to ensure the batteries are fully charged before the test is performed to eliminate that possibility.

The unit can also be used to measure the performance of the charging device (alternator / battery charger) - to inform the user whether the charging device is **good, weak or bad.**

Voltage & Temperature Monitoring System With Alarm

The voltage & temperature monitoring system measures 4 voltages and 3 temperatures. Not only can the unit monitor, it can also have each channel alarm at specific levels. The high and low voltage alarms and the high temperature alarms can be set by the user. When the unit alarms, a relay circuit can be activated to induce a response.

Manual lock or auto scan. The unit will, on default, simply scan through all 4 voltage and 3 temperatures remaining on each parameter for about 3 seconds. You have the option to allow continuous scan or simply lock the display on the one screen. Please note that even if you have locked the display on one parameter all the other parameters are still being scanned. If there is an alarm on one of the other channels while you have it locked onto a different channel the alarm will breakthrough. After you acknowledge the alarm the previously locked screen will return automatically.

Lock unit. For security, there is the ability to lock the settings by a code. In the case you have locked the unit it will only be possible to cycle through the displays on the screen and to mute an alarm.

Low voltage saving. The lowest voltage for each channel will be saved. The voltage has to remain at this level for minimum 10 minutes to be saved. This prevents the use of anchors / bowthrusters influencing the low voltage point, as these devices are only transient. This value can be deleted to run a new low voltage monitoring.

Removing unwanted alarms. There is an upper (voltage + temperature) and lower voltage alarm (voltage) for each setting. You may not wish to engage some of these alarms, you can simply remove any alarms you wish not to use.

Setting degree C or degree F scale.

Buzzer alarms: for any alarms the buzzer can be on or off. If on, the alarm can be muted.

Supply voltage: 8 - 35VDC
Current consumption: < 3mA
Temperature range: 10 - 150 Deg C

Remote Control:

Backlight colour user selectable (blue, red or green) or Auto select, changes colour based on alarms or conditions.

Screen alarms: for any alarms the screen will display a red screen.

Relay Circuit. There is a relay offering normally closed (N/C) or normally opened (N/O) switching. This can then be used to activate whatever you wish to upon the alarm levels being reached.

We predict this relay circuit shall be used to start up generators when the batteries get down to a certain voltage. Other examples, using temperature, would include an engine switching off under high system temperatures. There are an array of examples.

Background LED lights will only stay on in auto mode when the system has surplus power i.e. it's charging.

Special Generator start ability.

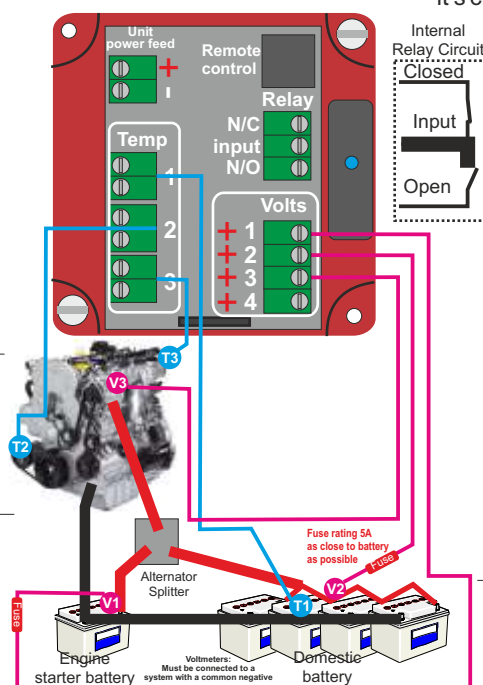
Switching a relay to activate a generator is quite simple. However, knowing when to stop it is more difficult. There are numerous options to stop the generator based on voltage, temperature or time. For instance you may wish to stop the generator when the batteries hit a certain voltage / temperature / after a set time. There is also a safety timeout setting to prevent the generator staying on indefinitely because the battery charger has failed.

Automatic backlight colour change.

The backlight can change its colour automatically if the colour change value has been tripped.

In a 12V system: <12.2V = red, <13.2V = green, <15V = blue, >15V = red.

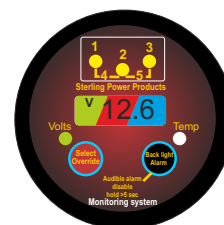
These values can be changed for each channel individually.



Kit includes:

- 1 x control box
- 1 x remote control
- 1 x temperature sensor

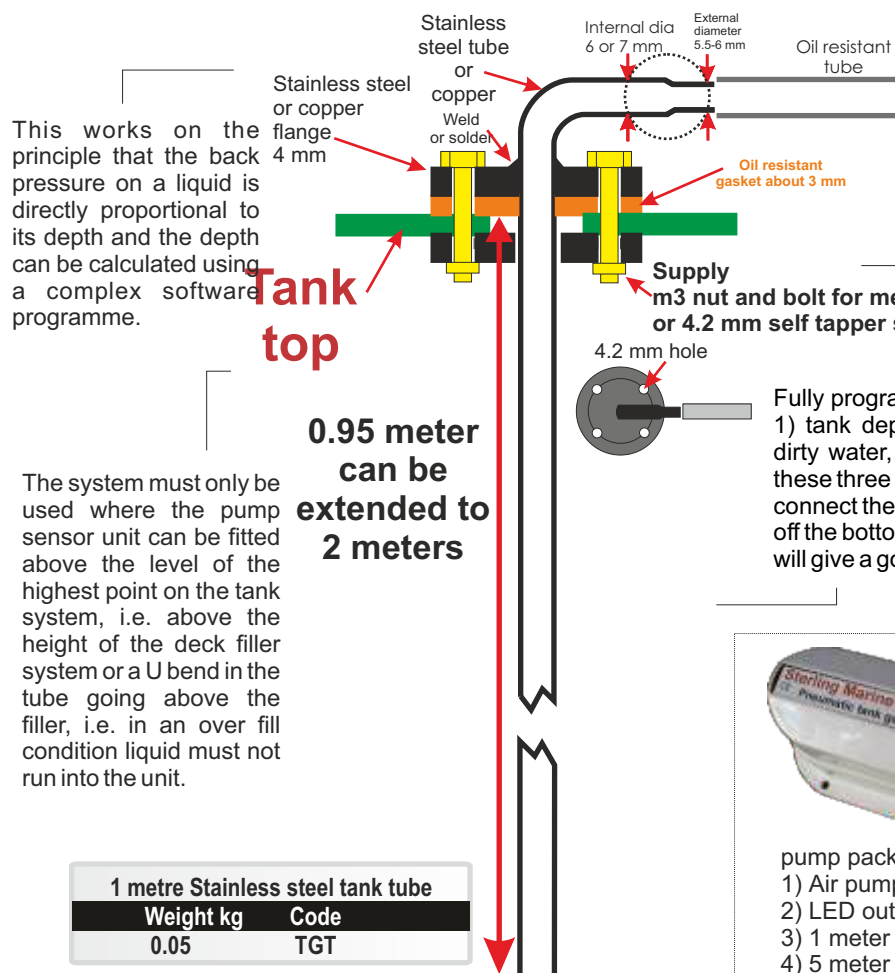
Voltage Temperature Monitoring			
Input DC (V)	Size L x W x D mm	Weight kg	Code
12-24V	70 x 70 x 60	0.2	TVM1
Extra temp sensors (1 included) purchase more			
			TS1



Pneumatic Tank Gauge System

Most boats suffer badly from unreliable tank level gauges, this is a particular problem with dirty water tanks. The main problem is the corrosive nature of the salt water and that float meters are damaged in the tanks. The measuring device must not be effected by the movement or the corrosive nature of the fluid it is measuring. The best way to achieve this is the way ships and other quality tank meters work by using pneumatics. This has always proved too expensive to miniaturise for leisure craft, use until now.

For a more accurate analysis the L.E.D display can be connected to the optional L.C.D display which will scan up to 8 tanks and display the depth in % full in rotation, when the fill button is pushed on the tank, for example tank 6, then the L.C.D. display will lock onto that channel.



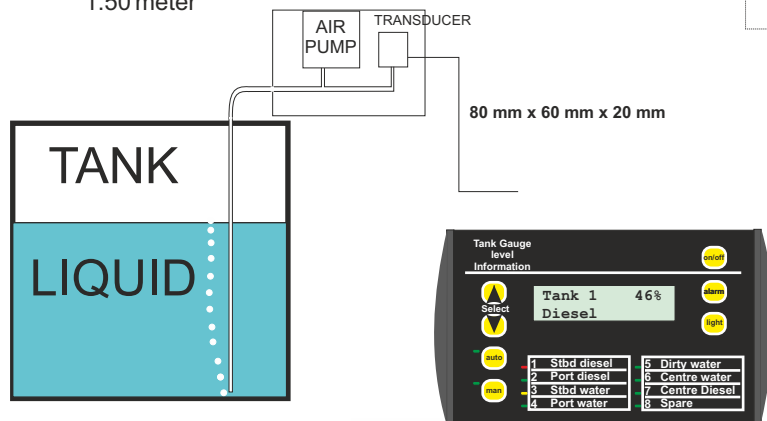
Fully programmable. The user programmes in 1) tank depth 2) fluid density (water, diesel, dirty water, petrol) 3) operation mode. When these three pieces of information are set simply connect the unit to a pipe which is about 10 mm off the bottom of the tank and the L.E.D. display will give a good indication of the depth.



pump package includes:

- 1) Air pump and transducer box
- 2) LED output display
- 3) 1 meter plastic pipe from pump to tank
- 4) 5 meter cable from pump to LED display
- 5) Full instruction set

MAX TANK DEPTH ON STANDARD MODEL SET ON WATER DENSITY 1.50 meter



Tank Gauge System Pump Package and LED Display		
Size L x W x D mm	Weight kg	Code
145 x 90 x 40	0.5	TGS

Quick check list

- No moving parts in the tank
- No electricity in the tanks
- Cannot stick corrode or jam up
- Not effected by any corrosive fluid
- Easy to replace or repair if faulty
- No need to test (set up in software program)
- Very accurate
- Alarms adjustable both ways
- Set for water, diesel, petrol, sea water
- Voltage 8-32V
- Self cleaning
- Local and remote readings

Multi tank gauge kit includes:

- 1) 8 tank LCD reader / scanner panel
 - 2) Selection of sticky labels with tank names
 - 3) 2 x 10 meter cables for 2 tanks
- Extra tank cables can be purchased.

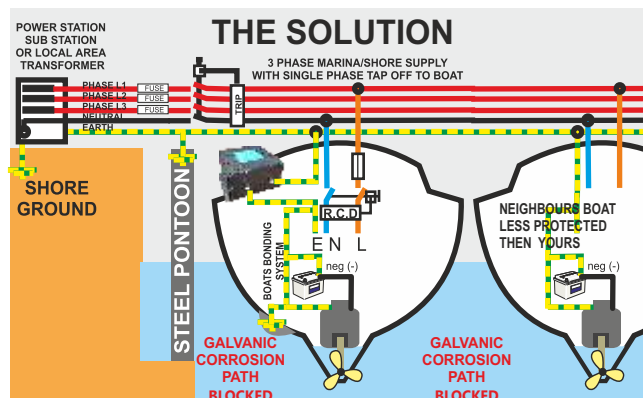
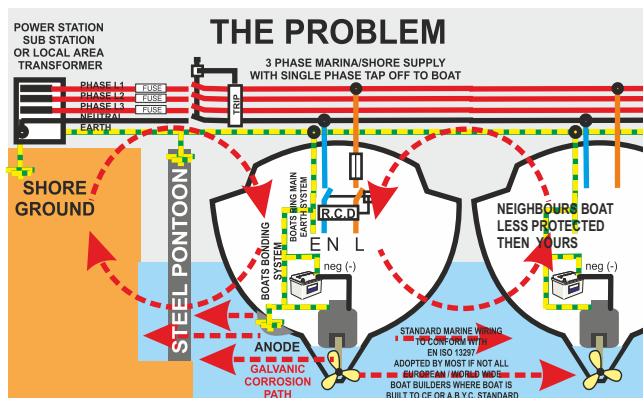
Tank L.C.D. Display Scanner Unit		
Size L x W x D mm	Weight KG	Code
90 x 60 x 20	0.2	TGM
Extra 10 meters of cable for pumps		TGL10
Extra 5 meters of cable for pumps		TGL5

Pro Save Range - Galvanic Isolators / Zinc Savers

16A - 120A Range

In order for modern boat builders to comply with modern CE standards such as EN ISO 13297 they must fit the shore earth wire to your boats bonding system which is also connected to the hull / anodes etc. This ensures that any 230V mains faults will operate the R.C.D on the boat in order to save your life. However, now your boat is connected to the rest of the boats in the marina. This results in 2 main problems. Firstly, any increase in voltage on any earth in the marina may result in the dissolving of your anodes. Secondly, if you have a zinc / magnesium / aluminium anode on your boat and the boat next to you (or marina) does not then your boat shall be protecting everyone resulting in dramatic losses of anode.

The solution, Sterling's **Pro Save**. The zinc savers maintain the continuity with the earth to ensure safety (EN ISO 13297 standard) but prevent any stray currents coming up the earth. The Pro Save has to be built to stringent testing and has to be able to carry its current rating for 24 hours without exceeding 90 degrees centigrade.



16A 30A 50A models

Rate to AC shore power rating.

Small Marinas 16A.
Medium Marinas 30A.
Large Marinas 50A.



ZS16A Model

For European use only due to ABYC non compliance.

Refer to overleaf for USA model ABYC compliant.



ZS30A / ZS30C models

Available with or without Internally installed capacitors. **The 30A and 50A models have 25,000uF 2.5V capacitors installed.**

This raises performance in extreme AC leakage conditions.



ZS50A / ZS50C models

Galvanic Isolators / zinc savers Standard euro version

AC (A)	Size mm	Weight Kg	Code
16	120 x 100 x 90	1.0	ZS16A
30	220 x 120 x 100	1.5	ZS30A
50	220 x 165 x 100	1.8	ZS50A

Galvanic Isolators / Zinc Savers Standard Euro Version **with Cap**

AC (A)	Size mm	Weight Kg	Code
30	220 x 120 x 100	1.5	ZS30C
50	220 x 165 x 100	1.8	ZS50C

Pro Save W - Waterproof Zinc Saver up to 110A

built to
IP66
WATERPROOF
Electrics
IP55
Replaceable fan

Safety first:
This product complies fully to European standard EN ISO 13297. Not to be used where UL / ABYC fail safe standard are required. See below.

The new range also offers two LED warning lights. The two warning lights indicate the following:
1) To indicate if there is a break through fault. For instance, if the earth voltage has exceed the ability of the device to protect the boat's system (very rare this would ever be the case).

2) Total failure due to massive short circuit way beyond the products ability to protect. The product has failed and the boat and personnel are in danger. If this fault is triggered, there are underlying issues beyond that of the normal safety features of the shore power system. The over engineered aspect of this product cannot be overstated.

The new Pro Save W offers all the same great protection as the Pro Save A+C models but in a new waterproof plastic package:

Stainless steel hardware and very low footprint, made possible by a new induction fan cooling system which only operates when the unit is in a major fault condition.



110A model

In fault condition the product does not exceed 90 deg C, during tests the product 24 hr fault temperature was sustained well below:

EN ISO 13297
Small Craft Directive

Waterproof Zinc Saver off fault plus 20%		
Model	Fault Current (24 hours)	End Temp (Deg C)
32A	41A	65
64A	85A	78
110A	152A	75

Waterproof Galvanic Isolator / Zinc Savers				
AC (A)	Size L x W x D mm	Weight Kg	Connector Code	
32	150 x 120 x 118	1.0	6 mm	ZSW32
64	150 x 120 x 118	1.0	6 mm	ZSW64
110	155 x 170 x 118	1.8	8 mm	ZSW110



32A / 64A model

Battery Maintainer

Echo / mirror charger

The battery maintainer is a charging device that enables an **extra battery bank** to be kept 'topped up' from the **main battery bank** which has the charging device(s) connected to it (e.g. alternator, battery charger, solar cell / wind turbine etc). The unit transfers approximately 3A (12V) and requires the charging devices to be turned on to work. It is best suited at keeping a starter battery topped up and maintained by the charge that your house bank receives.

How does it work?

The unit is activated when the main battery has reached around 13.3V (26.6V at 24V) and allows excess power to be transferred from the primary charging system to charge / maintain an auxiliary battery bank. The transfer current is 3A at 12V.

4 options:

12V to 12V
12V to 24V
24V to 24V
24V to 12V

Ideal for use on Boats, Camper vans and with Solar / Wind top up.

IP65 Waterproof (rated to)



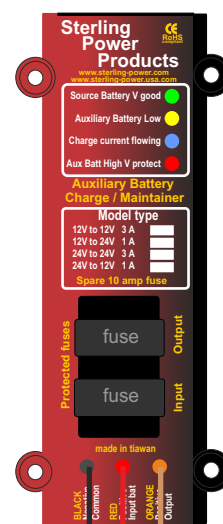
Ignition protected and reverse polarity protected.

It is simple to install and is a low cost product. Saving time on installation and money on repeatedly replacing destroyed flat batteries.

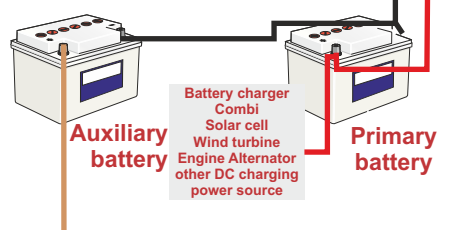
Power Saving. The battery maintainer uses FETs instead of relays and as such uses very little power itself (less than 1mA). This allows your solar harvest to be more efficiently distributed rather than lost across inefficient relays.

Other Specifications

Offline power consumption	0.001A
Online power consumption	1mA
Activation voltage input battery (x 2 for 24V)	13.3V
High voltage trip on input battery (x 2 for 24V).	15V
high temperature lock down (Deg C)	80
Off Voltage and Standby input battery (x2 for 24V)	12.9V
Reverse polarity protected (fuse).	
Aux battery 'low voltage' warning LED on if aux bat below 12.6V and 'off' above 12.7V.	



Battery maintainer / charger inc 1 metre of cable						
Input (V) DC	Output (V) DC	Current (A)	L x W x D mm	Weight Kg	Code	
12V	12V	3A	140 x 45 x 40	0.25	BM12123	
12V	24V	1A	140 x 45 x 40	0.25	BM12241	
24V	24V	3A	140 x 45 x 40	0.25	BM24241	
24V	12V	1A	140 x 45 x 40	0.25	BM24121	



High Power Distribution and Fuse Box

Up to 500A

Compact and clear DC distribution system for boats and specialist vehicles.

3 x ANL fused outputs from 80-500A ability.

extra aux DC feed position to bypass main feed in event of ancillary equipment requiring a permanent feed even if the main battery bank is isolated, such as alarms or bilge pumps.

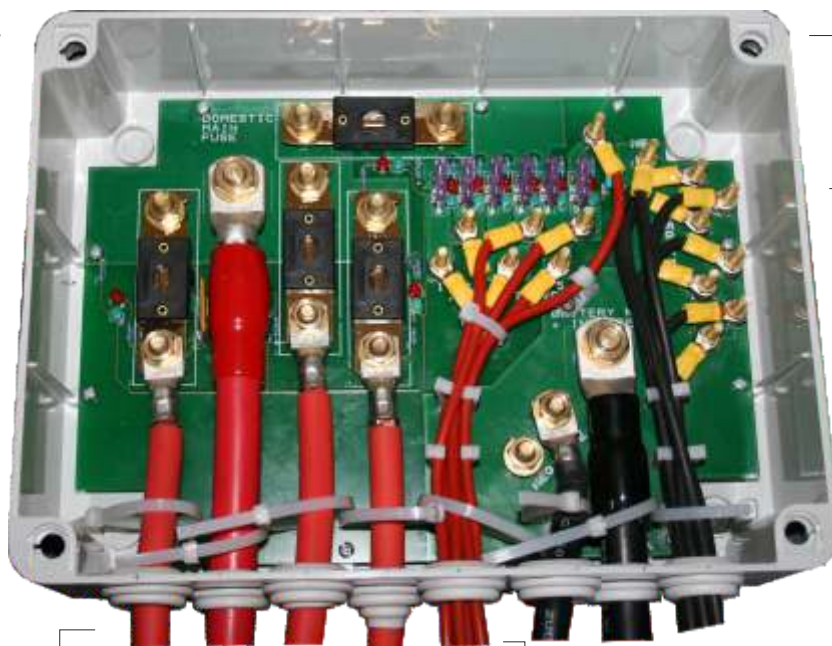
5 x 15A continuous outputs with 30A fuses with one 300A fuse supplying that section (all supplied).

Red LEDs to show when fuse has blown (only on when fuse has blown).

1 x 15A 'maintained' output with 30A fuse.

Cable guides for the low power cables, plus cable ties to be tightened when wiring complete to keep wires tidy and secure.

Green LEDs to show the circuit is live (LEDs on all the time when battery not isolated, can be switched 'off', if preferred, by removing a link).



1) Retail market: can modernise your old system and make it safer and easier to find fuses/cables in case of faulty circuitry. Install near domestic to meet modern safety requirements.

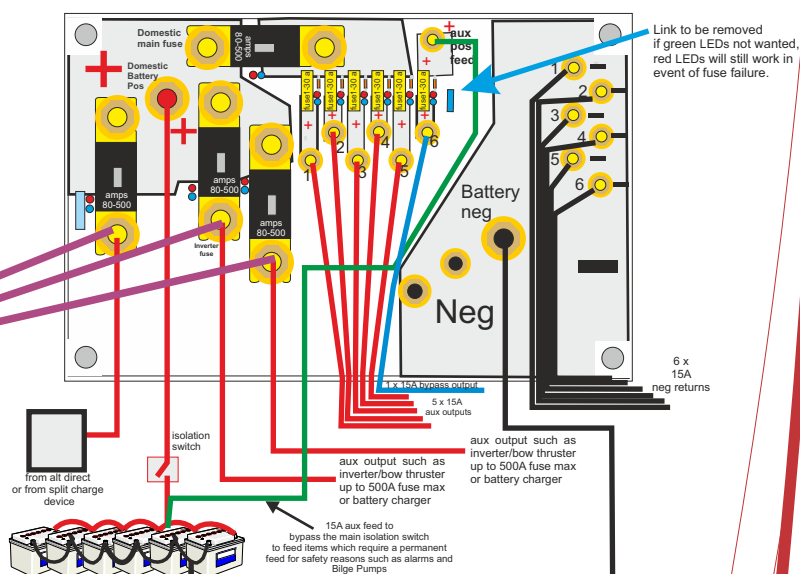
Most negatives returned to box to enable easy circuit checks.

Emergency alternator link in the event of the alternator fuse blowing (this prevents the alternator being damaged).

2) OEM market: it shall reduce wiring time and improve cable tidiness. Replaces the need for many individual parts to be fitted and connected. Saving both time and money.

3 GANL fuses are required to complete the Distribution box (indicated by the 3 purple lines). They are not supplied with the package. Please refer to the chart below for the correct GANL codes.

Fuse	Code
80 amp	GANL80
100 amp	GANL100
150 amp	GANL150
200 amp	GANL200
250 amp	GANL250
300 amp	GANL300
350 amp	GANL350
400 amp	GANL400
500 amp	GANL500



FINISHED UNIT SHOULD LOOK LIKE THIS (clear plastic cover lid removed for better picture)

DC High Powered Fuse Distribution Box		
Size	Weight	Code
300 x 220 x 120 mm	1.5Kg	PPD500

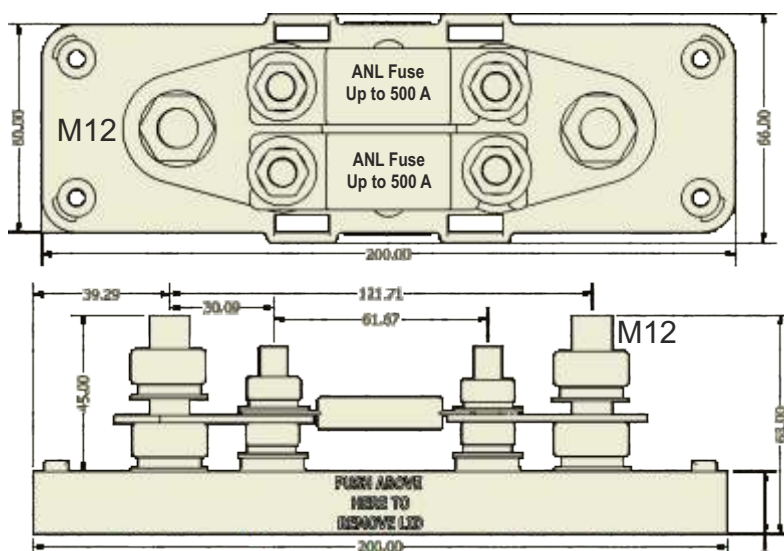
ANL Fuse Holders

M8 (up to 500A) & M12(up to 1000A) ANL



Fits 2 x 500A fuses
up to 1000A total

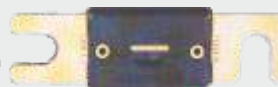
- Stainless fittings (non ferrous).
- M12 cable connector.
- Up to 1000A of fuses.
- Twin or single fuse function.
- Single or twin output.
- Ventilated cover protection.
- Isolated rear protection.



M8 Gold ANL Fuse holder (no fuse included)

Main connector	Current (A)	Size L x W x D mm	Code
8 mm	500	145 L x 55 W x 53	GFH8
12 mm	1000	200 L x 66 W x 69	GFH12

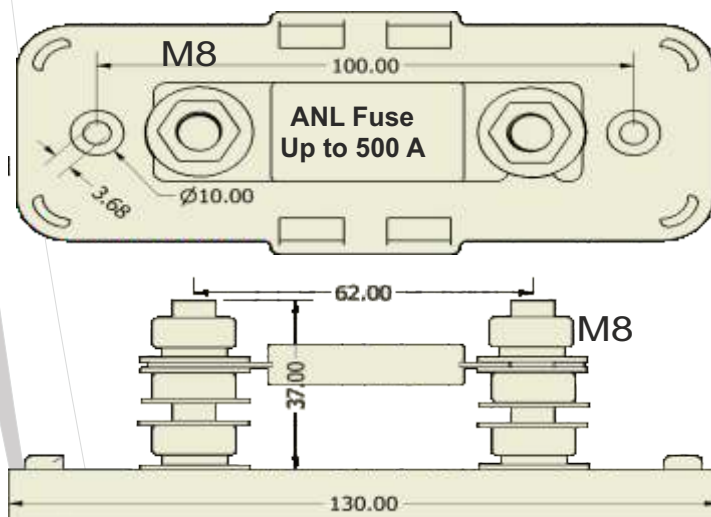
Full range of
Gold plated ANL fuses
See Sterling Gold section



Part Number GANL(x*) (AMPS)
With mica window
*x = 80A, 100A, 150A, 200A, 250A,
300A, 350A, 400A, 450A, 500A

- Stainless fittings (non ferrous).
- M8 cable connector.
- Up to 500A fuse ventilated cover protection.
- Isolated rear protection.

Fits 1 fuse
up to 500A



BATTERY TERMINALS sets (come in pairs)



GBT-600PN 8 mm bolt 80g	GBT-1000PN 10 mm bolt 100g	GBT-100PN 8 mm bolt with WING NUT 110g	GBT-700PN 10mm CABLE CLAMP 95g
--------------------------------------	---	---	---

SOLID BLOCK POWER DISTRIBUTION

Ideal for negative returns



Footprint 105 mm x 65 mm



Footprint 105 mm x 65 mm



Footprint 90 mm x 5 mm

GPB-102468 CABLE DIAMETERS 1 X 12 mm 2 X 10 mm 6 X 8mm 407g	GPB-1044 CABLE DIAMETERS 1 X 12 mm 4 X 10 mm 431g	GPB-2488 CABLE DIAMETERS 2 X 10 mm 8 X 8mm 232g
---	---	---

FUSE BLOCK SERIES FUSE TYPE AMT RANGE 20-80A 0-32 V MAX

Ideal for fused high current positive distribution fused outputs



Footprint 110 mm x 80 mm



Footprint 105 mm x 55 mm

GMFB 3448 3 X 10 mm IN (SOLID) 4 X FUSED 6mm OUT1320g	GMFB 1428 1 X 10 mm IN 2 X 6 mm OUT 170g
--	---

FUSE BLOCK SERIES FUSE TYPE ATQ RANGE 3-35A 0-32 V MAX

Ideal for lower current positive distribution fused outputs



Footprint 90 mm x 65 mm



Footprint 90 mm x 65 mm



Footprint 85 mm x 40 mm



Footprint 85 mm x 40 mm

GATC 4848 4 X 6 mm IN AND FUSED OUT 220g	GATC 3448 3 X 10 mm IN (SOLID) 4 X 6 mm FUSED OUT1223g	GATC 2828 2 X 6 mm IN FUSED OUT 115g	GATC 1428 1 X 10 mm 2 X 6 mm FUSED OUT115g
---	---	---	---

FUSE BLOCK SERIES FUSE TYPE AUE 1-80A 0-32 V/125V/250V

Positive fuse distribution where ignition protection regulations apply for R,C,D or U.L. directives



Footprint 105mm x 80 mm



Footprint 105mm x 80 mm



Footprint 105 mm x 55 mm



Footprint 05 mm x 55 mm

GFB 4848 4 X 6 mm IN 4 X 6 mm FUSED OUT 371g	GFB 2828 2 X 6 mm IN 2 X 6 mm FUSED OUT 203g	GFB 1428 1 X 10 mm IN 2 X 6 mm FUSED OUT 228g
---	---	--

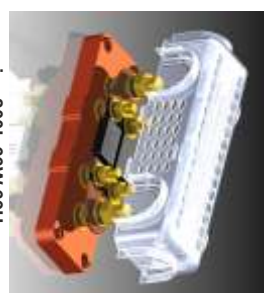
24Kt Gold Plated

All products are precision machined from solid brass with a 24Kt gold finish. Pre display packed. Do not confuse with lower cost zinc-lead alloy die-casting.

All these products take 1 or 2 GANL fuses select size off fuses below



size 145L 55W 53H mm



size 200L 66W 69H mm



Footprint 185 mm x 55 mm

NEW GFH8 8 mm stud up to 500A single ANL fuse holder	NEW GFH12 12 mm stud up to 1000A twin ANL fuse holder	GANLW 1 1 X 12 mm IN 1 X 12 mm FUSED OUTPUT 340 g
---	--	---

SINGLE IN LINE FUSE HOLDERS FOR AUE FUSE



Footprint 90 mm x 20 mm



Footprint 80 mm x 35 mm



Footprint 185 mm x 55 mm

Single AUE fuse holder 10mm cable with eye
Bolt for battery terminal 50g

Single AUE fuse holder suitable for ring terminals comes with 80 amp fuse plus spare fuse in internal holder can be used with all AUE fuses 50g

Ring connector

Ring connector



Footprint 148mm x 110 mm



Footprint 148mm x 110 mm

FUSE TYPE RESET or ATQ GMFBR 4 X Holder for RESET FUSE and AMT fuse range	FUSE TYPE AUE+AUE-L GFBFR 4 X holder for AUE fuse range
---	---

FUSE SERIES 24 KT GOLD PLATED



ATQ 17 AMPS 5A TAN 10A RED 15A LT BLUE 20A YELLOW 30A LT GREEN 35A PURPLE	GAMT 17AMPS 20A YELLOW 30A LT GREEN 40A ORANGE 50A RED 60A LT BLUE 70A TAN 80A CLEAR	GAUE 17AMPS 2A 4A 6A 10A 20A 25A 30A 40A 50A 60A 70A 80A	GAUE-L 17AMPS Built in light which lights up when fuse blown 2A 20A 25A 6A 30A10A 40A 15A 60A	GANL 17AMPS Mica window 80A 250A 100A 300A 150A 350A 200A 400A 500A
--	--	--	--	--

Jump Starting Modules

Module 1 - JSC1

Jump starter | DC to DC charger | Power Supply | Battery Balancer

Suitable for use with modern engines with Smart Alts/regen systems



® Trademark of
Mercedes Benz



® Trademark of
Vauxhall / Opel



® Trademark of
Volkswagen



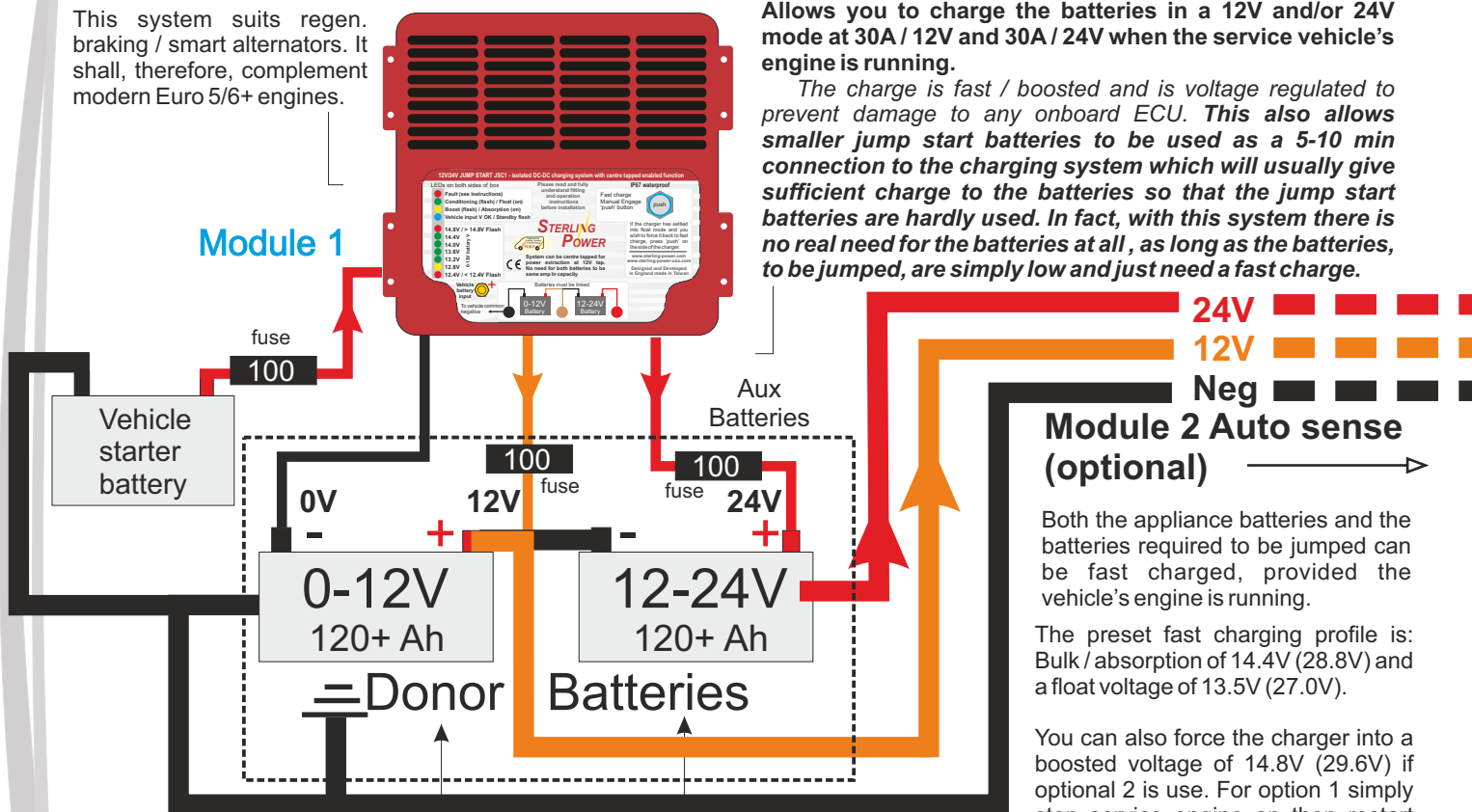
® Trademark of
Ford

Module 1 (below) fast / boost charges the auxiliary 12V/24V service batteries on the service vehicle when engine is running - this jump start and battery charging scheme is fully voltage regulated to prevent high voltages and so preventing any damage to the vehicle you are working on, for example, its ancillary equipment - such as ECUs. The unit can also continuously supply 24V to the lorry to charge the batteries. It can be left on indefinitely (as long as the van is running) as a power supply to allow long term heavy duty work to be carried out - tail lifts, etc. The service batteries are the donor batteries (below) in the jump starting process. These batteries, whether they be 12V or 24V, can be charged independently at 12V or 24V (isolated) at about 30A (12V or 24V). Simply connect it between the vehicle's starter battery and the donor battery (as depicted below). This system shall automatically do all the charging with no human interaction. **Module 1** can be used for manual jump starting, where the operator wishes to **manually** choose between 12V and 24V when jumping the recipient battery (overleaf). This offers both jump start and fast charge. Module 1 can be used without Module 2, the auto select module. The service vehicle's own electrical system is fully protected from back feeds from the 12/24V side and any surges which will take place in the service vehicle's jump start system.

This system suits regen. braking / smart alternators. It shall, therefore, complement modern Euro 5/6+ engines.

Allows you to charge the batteries in a 12V and/or 24V mode at 30A / 12V and 30A / 24V when the service vehicle's engine is running.

The charge is fast / boosted and is voltage regulated to prevent damage to any onboard ECU. **This also allows smaller jump start batteries to be used as a 5-10 min connection to the charging system which will usually give sufficient charge to the batteries so that the jump start batteries are hardly used. In fact, with this system there is no real need for the batteries at all, as long as the batteries, to be jumped, are simply low and just need a fast charge.**



Freedom to maintain a 12V appliance battery for an inverter (example) with the convenience of having a 24V and 12V bank for jump starting.

Battery banks do not need to be identical. The 12V battery, for example, could be larger (200Ah+) to accommodate an inverter or other 12V appliances. The neighbouring battery (combined for 24V) could be smaller as this could be 60Ah just needed for putting in series for the 24V jump.

Module 2 Auto sense (optional)

Both the appliance batteries and the batteries required to be jumped can be fast charged, provided the vehicle's engine is running.

The preset fast charging profile is: Bulk / absorption of 14.4V (28.8V) and a float voltage of 13.5V (27.0V).

You can also force the charger into a boosted voltage of 14.8V (29.6V) if optional 2 is use. For option 1 simply stop service engine an then restart and you will automatically be in fast charge mode to the jump start vehicle.

No fear of centre tapped charging problems as both the 12V battery and 24V battery are charged independently at their own profile. Thus, automatically balancing the 24V bank.

Module 1 kit (JSC1MK) optional

JSC1MK - what comes with the kit?

- 3 x 100A (GANL100A) fuse.
- 3 x GANL fuse holder (GFH8).
- 12 x 8mm eye terminals for crimping/soldering to charge cables.
- **THE KIT DOES NOT INCLUDE THE CHARGER.**

Fuse Holders and Fuses

3 x GFH8



3 x 100A GANL fuse

Part	Description	Code
Module 1 (just the charger)	12V to 12V/24V Charger 30A w/ 2m pre-wired DC cable	JSC1
Module Kit (not inc. charger)	3 x 100A ANL fuse + 3 fuse holders + 12 x 8mm eye terminals	JSC1MK

Module 2 - JSC2

Automatic 12V / 24V Auto Select Jump Starting Device

Module 2. This module adds an extra safety layer and automates the jumping procedure. It auto selects the correct voltage (12V or 24V) for jumping the recipient batteries. It also disengages the circuit when the jumping clips have been disconnected from the recipient battery terminals ensuring any jump leads not connected to a battery are "dead". Module 2 also relays on the regulated charge profile generated from module 1 to the recipient batteries. You can also force the unit to operate outside of its preset parameters, in the few circumstances where this is required.

Totally automatic safety function.

If voltage sensed is 4V-16V then 12V is selected. If 16V-32V then 24V is selected.

12V and 24V modes can be forced if required, however, at 16V+ and 32V+ warning alarms shall sound. Also, trying to force select into a battery where the auto system disagrees will alarm and require the force select button to be pushed again. Below 4V the unit can also be forced, however, chances are the sub 4V battery shall need replacing.

Once the relays engage, a signal is sent back to module 1 to force module 1 into boost mode. This enhances the charging voltage relayed on to the recipient batteries.

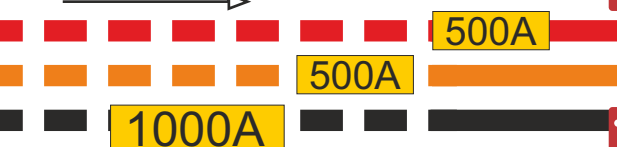
Once the jump leads are removed from the batteries or the current drops below 5A the unit will automatically disengage.

This safeguards against live 12V or 24V at the end of the jump cables which are not in use.

700A continuous rating 1000A cranking (dependent on your battery and cabling ability)

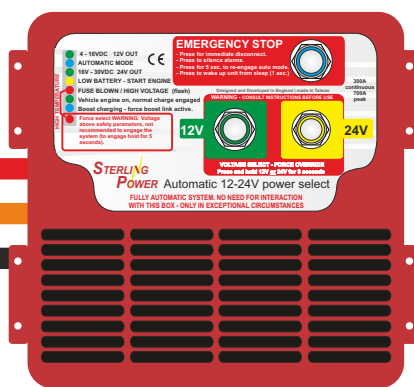
If battery requiring jumping is not absorbing current, due to fault, this <5A disengage can be force overridden for 20 seconds to try to start the battery charge process.

From Module 1



Fuses for illustrative purposes only. Fuses should be connected nearer to input battery.

Battery and Jump cable (per meter)		
Double PVC insulated welding cable		
CSA(mm ²)	Colour	Code
50	Red	C50R
50	Black	C50B
70	Red	C70R
70	Black	C70B
95	Red	C95R
95	Black	C95B
120	Red	C120R
120	Black	C120B



Module 2

Croc clips not included



DC cable length is optional. Please refer to the chart to the left. The image is for display purposes only. **Cables do not come with the module kit.**

Jump cables - connected to recipient batteries (batteries that require charging or jumping). These are not included.

Jump cables - not only provide automatic 12V or 24V jump starting they also charge the batteries if needed. Either in normal fast charge or an even faster boost charge. Both charge functions are fully regulated and will not damage any ancillary equipment in charging mode.

Module 2 kit (JSC2MK) optional

JSC2MK - what comes in the kit?

- 4 x 500A ANL (GANL500A) fuse.
- 1 x GFH12 (for 2 x 500A ANL fuse).
- 2 x GFH8
- NO HEAVY DUTY CABLES SUPPLIED
- THE KIT DOES NOT INCLUDE MODULE 2 DEVICE.

Fuse Holder and Fuses

1 x GFH12



2 x GFH8



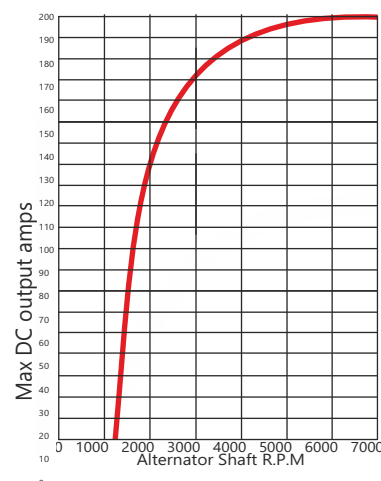
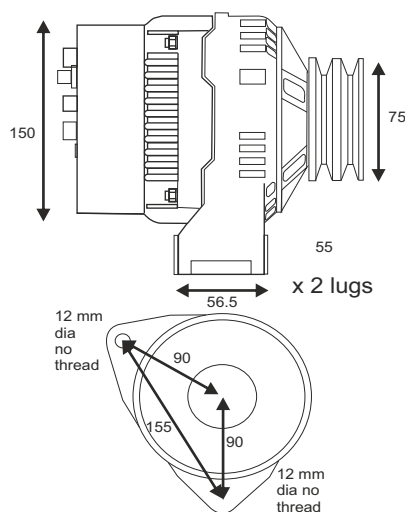
4 x GANL500A

Part	Description	Code
Module 2 (just the device)	Automatic jump starter	JSC2
Module Kit (not inc. device)	4 x 500A fuse w/ 1xGFH12 + 2xGFH8 fuse holder	JSC2MK

High Power Performance Alternators



12V / 200A
Good Low R.P.M
Performance



Description

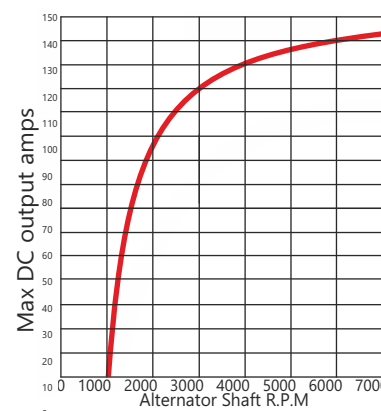
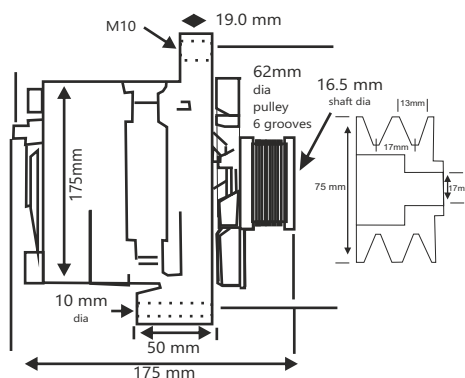
12V 200A alternator with standard reg
12V 200A alternator with standard & PDAR

Code

AL12200
AL12200PDAR



12V / 140A
Good Low R.P.M Performance alternator
supplied with multi V and twin V pulley
photo shows multi V.



Description

12V 140A alternator with standard reg
12V 140A alternator with standard & PDAR

Code

AL12140
AL12140PDAR

Alternator Open Circuit Protection Device

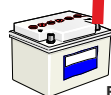
Protects your alternator from **massive spikes** caused when you inadvertently isolate an alternator by switching the battery off or a cable is loose or a fuse blows.

Protects against any action which results in the alternator being disconnected from a battery when in operation.

Simple safe emergency route for that spike to be discharged giving full protection to the alternators regulator

IP67

Alternator standard Switched path



Emergency alternator route



The protection device does not carry the main current of so only light wiring is required.

Unit works with any alternator or splitting device (12V or 24V).

Alternator protection device

Voltage	L x W x D mm	Weight Kg	Code
12V	90 x 90 x 60	0.25	APD12
24V	90 x 90 x 60	0.25	APD24

Pro Pulse

Battery De-sulphation & Maintenance device

Prolongs battery's life by up to 100% and improves battery performance: Sulphate build up on plates reduces the battery's life span and performance.

By connecting a Pro Pulse this sulphate is removed and allows the battery to live longer and have greater performance.

Connect across 12V: The Pro Pulse reverse feeds a small electrical pulse back into the battery which prevents and also reverses sulphation on the battery plates.

This is not a battery charger and it cannot actually charge your batteries, it is a desulphation device.

By keeping the plates clean and free from sulphation the battery stays fresh and responsive to charging and discharging.

New Models good for up to 500Ah battery bank at 12V.

Waterproof IP66 (built to).

Offline current draw 1.8mA



Not required if you already have an advanced battery charging system from Sterling as they have desulphation cycles built into their charging profiles.

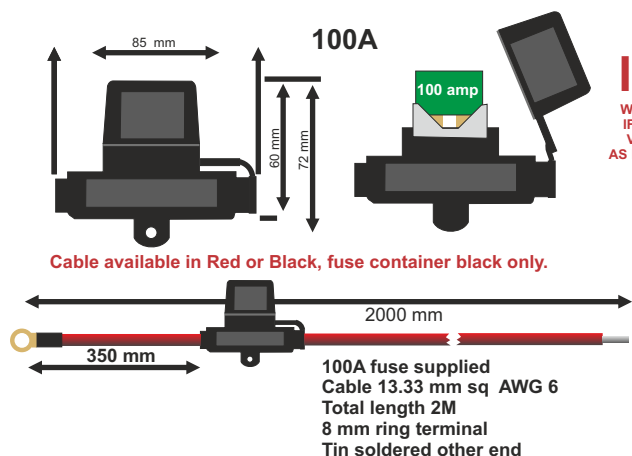
Model good for up to 150Ah battery bank at 12V.

Rejuvenates older battery(s) and sharpens their response. This allows them to accept faster charge and preserves their cold cranking ability.

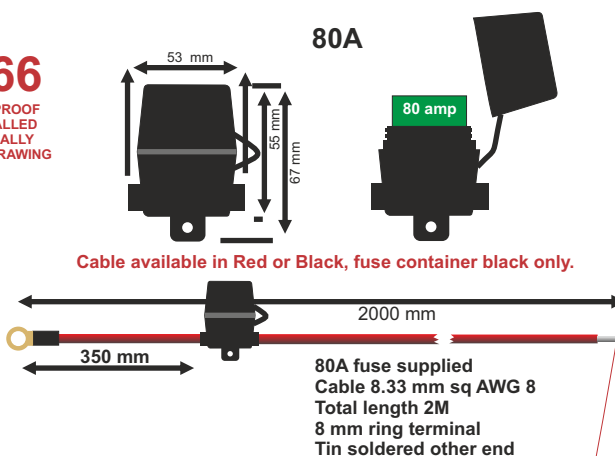
Requires a charging source to operate. It shall not deplete your battery bank. Operation voltages are 13.3V+ (at 12V) and 26.6V+ (at 24V).

Description	Size mm	Weight kg	Code
De-sulphation unit 12V - up to 150Ah bank (IP66)	90 x 90 x 60	0.2	PPW12150
De-sulphation unit 12V - up to 500Ah bank (IP66)	90 x 90 x 60	0.2	PPW12500
De-sulphation unit 24V - up to 250Ah bank (IP66)	90 x 90 x 60	0.25	PPW24250

2M Pre-fused (80A / 100A) Cables



IP66
WATERPROOF
IF INSTALLED
VERTICALLY
AS PER DRAWING



Code	Description
FRAWG6	AWG 6 Pre-fused (100A) Pre-wired, (2m), RED
FBAWG6	AWG 6 Pre-fused (100A) Pre-wired, (2m), Black

Code	Description
FRAWG8	AWG 8 Pre-fused (80A) Pre-wired, (2m), RED
FBAWG8	AWG 8 Pre-fused (80A) Pre-wired, (2m), Black

Daisy Chain - Temperature alarm

Most problems caused on engine systems can be pre-empted and stopped before any catastrophic failure takes place. Many of these failures are caused by run away temperature rises on batteries / hydraulic systems / bearings etc. The Daisy Chain can be installed in these key areas and an alarm is sounded and/or a relay triggered to prompt a response.

How does it work?

1 to 100 digital normally closed switch temperature sensors can be added in series. If any one of these sensor alarms (open circuits). The temperatures can be mixed within the same chain.

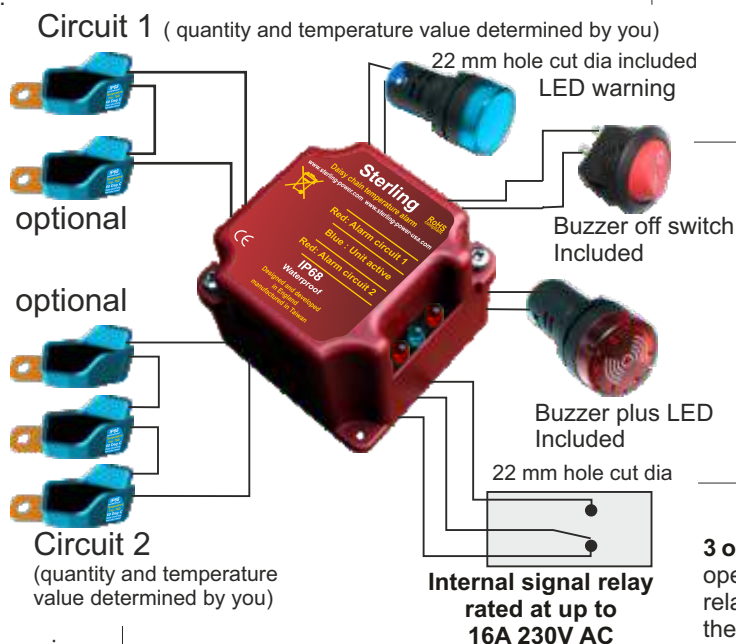
The Daisy Chain is a trip/warning device to indicate when a safe working temperature has been exceeded - this prompts a response from you or a preset automatic response.

This product should be seen as a final response alarm where some major action is required to save the day.

Built to IP66 waterproof

Where would I use this?

A typical use would be if your batteries are prone to over heating due to one being defective. Use a 60 Deg C sensor on each battery within the bank and the unit will inform you of over temperature on the bank.



Included:
1x Remote LED
1x Buzzer (w/ LED)
1x Switch (Buzzer off)

Multiple components are optional.

Sterling has a more expensive version which looks at actual temperature and temperature rises. It also has remote display for the temperatures, look at the Sterling Voltage Temperature monitor.

There is no limit to the mixture of sensors you use or how many you use. Bear in mind the more sensors you use the less specific the alarm is. For instance, if 10 sensors are fitted you do not know which one triggered the alarm.

3 outputs signal relays offers both open circuit relay or a closed circuit relay. When the alarm is triggered the relay switches to prompt the response. This relay is rated to 16A.

Could be used to switch of an engine or turn off a battery charger (preferably via a contactor).

Range of temperature sensors: 50 - 60 - 70 - 80 Deg C.

You can pick and mix sensors. It can be any manufacturer - provided the relay is normally closed circuited. Any sensor which goes from a closed circuit to an open circuit will alarm the unit.



Item description:

12V Connection box plus 1 x Remote LED 1 x Buzzer, Switch (alarm off).
24V Connection box plus 1 x Remote LED 1 x Buzzer, Switch (alarm off).

Code

TSB12
TSB24

Temp sensor IP68 waterproof (No temp sensors supplied with unit)

50 deg C = 122 deg F	Digital temp sensor
60 deg C = 140 deg F	Digital temp sensor
70 deg C = 158 deg F	Digital temp sensor
80 deg C = 176 deg F	Digital temp sensor

TSD50
TSD60
TSD70
TSD80

What is Power Factor Correction (PFC)?

This can be split into 2 groups:

Active PFC - by far the best, this gives a full input voltage range from 80-300V, and (in more technical terms) massively reduces the VA off the product so it will work with about 40% less current and power from generators. This accounts for about an extra 20% cost over the other type.

Passive PFC - this is a simple way of matching the units capacitance with an inductor to balance the load. This allows the unit to pass EU laws regarding harmonic distortion but does not actually fix the harmonics. This results in a much lower cost product with much lower input voltage variations. I.e. 210-230V abilities at much higher VA rating so a generator would need to be about 40% larger to run the product. I.e. a 12V 60A active PFC charger would run on less than a 1000W gen set but a passive charger of the same size would need about 1500W.

This feature is a big deal and should not be ignored especially on boats or vehicles where there are large voltage variations on the input. Even in 110V or 230V only areas, the voltages can easily drop 10%. With Active PFC this is of no concern with Passive PFC the charger will simply stop working.

Power factor Correction (PFC) is the concept that cleans up the electrical waves. By doing so, it increases the efficiency of the charger significantly. Efficiency is measured by the power going out (DC) and the power going in (AC) times 100. Prior to PFC a chargers efficiency ran at about 65% (35% energy wasted through the charger). With PFC the efficiency figure is more like 90% (only 10% lost through the charger). PFC, therefore, makes electric bills cheaper and enables one to run the charger from a smaller generator.

Active PFC shall more than likely be advertised as a selling point to the product.

If not advertised assume passive PFC.

IP RATINGS SCALE

The Ingress Protection (IP) rating system is an internationally recognized scale that relates to proven protection against environmental factors such as liquids and solids.

Ingress protection ratings can be identified by the letters IP, followed by two numbers. These numbers define the amount of protection a digital scale has against specified elements and its ability to resist foreign matter that could otherwise get inside the product and cause it to fail.

The first number refers to the amount of protection a scale or indicator enclosure has against solid matter (such as dust particles), while the second number defines the level of protection against liquids. The larger each digit is, the greater the protection.

First number - Protection against solids

0	No protection.
1	Protected against solid objects greater than 50 mm.
2	Protected against solid objects greater than 12 mm diameter.
3	Protected against solid objects greater than 2.5mm diameter.
4	Protected against solid objects greater than 1.0mm diameter.
5	Dust protected.
6	Dust tight. No Ingress of dust.

Second number - Protection against liquids

0	No protection.
1	Protected against vertically dripping water.
2	Protected against dripping water when tilted up to 15°.
3	Protected against spraying water at an angle of up to 60° from vertical.
4	Protected against splashing water when the enclosure is tilted at any angle up to 15°.
5	Protected against water jets from any direction
6	Protected against heavy seas or powerful jets of water.
7	Protected against the effects of short term immersion (under defined conditions of pressure and time).
8	Protected against submersion (under conditions specified by the manufacturer).
9k	Protected against close-range high pressure, high temperature spray downs.

Courtesy of www.averyweigh-tronix.com

What is Regenerative Braking?

Please see **page 17** for a comprehensive explanation.

Why choose the Alternator to Battery Charger over an Advanced Alternator Regulator?

Ease of installation, is the simple answer. They both end up doing the same thing but by very different technologies. The advanced regulator is a lot cheaper but can be hard to fit. The alternator to battery charger is a lot more expensive, easier to fit and has a few extra features like an internal splitting system.

Why Choose a Battery to Battery Charger over an Alternator to Battery Charger and an Advanced Alternator Regulator ?

The Battery to Battery Charger is a trouble free installation. Both the Advanced Regulator and the Alternator to Battery charger would cause problems with vehicles with complex ECUs. This is all European vehicles. Most American vehicles may still be okay (this will change over the years). The Battery to Battery Charger connects to the engine starter battery and has 100% nothing to do with the primary system (other than taking its power). All complex aspects off the primary system are left in tact. This ensures no problems will be reflected in the standard engine management system.

Which Battery to Battery Charger to use?

Features	1 New Batt to Batt	2 Waterproof 60A-120A	3 IP68 waterproof	4 Original	5 Original with RBF
Waterproof		●	●		
Including cables and fuses		●	●		
Current limiting	●	●	●	●	●
High V reduction and low V Boost	●	●	●	●	●
Battery type adjustable 6 types		●	●		
Battery type adjustable 8 types		●	●		
Battery type adjustable 9 types	●				
Battery type adjustable 4 types				●	●
Custom set	●	●	●	●	●
Lithium battery type	●	●	●	●	●
Fan cooled	●	●	●	●	●
RBF friendly	●	●	●		●
Adjustable current limit	new 120-240 model				

Why Choose an Alternator to Battery Charger over an Alternator Regulator?

Alternator to regulators have the following disadvantages to the Alternator to battery chargers:

Relatively difficult to install: This limits semi skilled personnel for fitting.

Requires the removal of the existing alternator to work on it: This can be awkward and time consuming.

Requires extra cables to be run on the boat or vehicle: This can be again be time consuming and awkward.

Warranty on new engines: Some engine / vehicle dealers raise warranty issues if a new alternator is modified to fit an advanced regulator.

ECU Problems: Many new engines have ECU's (electronic control units) on their engine management systems, any attempt to fit an advanced regulator will result in alarms going off (mainly in vehicles, motor homes and the latest marine engines). The Alternator to Battery Charger ensure the main vehicle / boat voltage remains within the ECU's programmed parameters and allows the extra battery bank to be charged at the higher voltages needed to achieve fast charging.

Total Package: 95% of installations using an advanced alternator regulator also have some sort of split charger system whereas the alternator to battery charger already has that built in.

What is Current Limiting?

Current limiting is the ability of the product to internally limit the current which it will allow to pass through itself. This prevents damage to the unit in the event of heavy current draw (larger than the rating of the product) such as engine starting and large bow thrusters/inverters. This also allows multiple units to be used on the same battery banks with no overloading of one unit. Any size charger / alternator can be used with a current limited device and this device shall limit the current to the rating of the device.

Can I use my solar panels in conjunction with Sterling's charging products?

Yes, they will work, they have nothing to do with each other but the solar systems will not affect nor interfere with any Sterling Power system.

How to rate the size of a charger:

This very much depends on circumstance:

- 1) From standard shore power, the rule of thumb is to charge at about 10% of the Ah capacity of your battery bank(s). This is ideal if leaving to charge overnight or time is not a big factor. An empty battery (about 80% empty) would fully charge in about 8-10 hours.
- 2) If charging from a generator, to save on generator hours / fuel, it is recommended to rate the charger to 25%+. The larger the charger the faster the charge rate and the less hours on the generator's set. This is a purely financially driven decision based on your requirements.
- 3) A user may wish to really thump current in to their batteries in order to get them charged quickly between short stops. They may be using AGMs and are willing to replace them regularly (as they shall not live long). In this case rate the charger at around 50%+ of Ah capacity. For batteries like lithium it could be as high as 1C which is charging at the total rate of the battery's Ah in one hour. You could actually use 400A of battery charging on a 400Ah lithium battery bank and charge in 1 hour.

Note. Rate to continuous onboard use. E.g. Using 50A, only charging at 20A, equals a 30A deficit. In this case, use at least a 50A charger.

Need a larger charger than Sterling can provide?

The Sterling Pro Charge Ultra range is digitally controlled and current limiting. This allows numerous units to be put together in parallel (to increase current rating) or to be put in series (to increase voltage rating). A typical example would be someone wanting 120A charger at 12V. Simply add 2 PCU1260 in parallel. Likewise, you could add 2 PCU2430 together in series to get 30A at 48V.

How to Calculate Fuse Ratings.

In order to work out the size of fuse needed, follow this formula for working out the fuse rating, voltage or wattage for each appliance:

$$P (\text{power Watts}) = V (\text{Voltage}) \times I (\text{Amps})$$

The current the product will pull can be calculated by dividing the power used by the appliance by the voltage going into the appliance:

$I (\text{Amps}) = P (\text{Watts}) \div V (\text{voltage})$ for a fuse you like to work from 50-200% above this amp rating depending on the product. For example, if you using a 2500W inverter which is about 200A load, the inverter may have a large short term overload of say 4000W, so the fuse would be able to deal with that surge. The same would be true for a bow thrusters, anchor winches, air conditioners where there is a sizable overload ability - rate to double the continuous load. However, for fixed loads with no overload (e.g. lights) then 30-50% above is fine. Remember, the fuse is to protect the cables not the product, also, note that any wire directly connected to a battery should be fused.

DC voltage measured	DC 12V (fuse size)	DC 24V (fuse size)
Fridge (40W)	6A	3A
Hairdryer (1400W)	200A	100A
Kettle (1600W)	200A	100A
Laptop PC (350W)	50A	25A
Microwave (1400W back plate)	200A	100A
Television (300W)	50A	25A
Washing Machine (2200W)	300A	150A

How Effective is Advanced Battery Charging?

We are asked all the time 'do i really need advanced charging on my batteries?' What effect does a split charge diode have on charging? what % improvement will our products have on a system? Will the extra fast charging boil my battery? Will it excessively gas the battery? what effect, in real terms, can i expect? Most of the questions stem from old wives tales rampant in this market. The idea behind this article is to lay to rest any and all of them and offer the facts. Remember the below results are extreme and meant to show just how hard you can charge an open lead acid battery with no adverse effects. The results were all data logged and were 100% real and reproducible. They are neither guess work nor are made up.

Voltage versus current absorbed test

Part 1: The effect of voltage on battery charging

There is no magic with advanced charging systems, in effect, all they do is increase the differential voltage between where the battery is and the charge voltage. In other words the higher voltage that is applied to a battery the faster it will charge. However, on the down side if you do not control that higher voltage after the charge then you will damage the batteries. This simple experiment will show you the direct relationship between actual voltage applied to a battery and the current (A) being absorbed by it. This will give you some idea how your system can be improved and where the problem may lie.

This information is 100% accurate and can be reproduced on any test bench at any time,

The test is very simple and not open to miss interpretation. We will use a simple 100Ah lead acid, so called 'leisure battery', a low cost, nothing fancy battery. All we have done is to discharge the battery to about 50%, then connect it to a 180A regulated power supply. We will simply present the battery a starting voltage of 13.2V and see how much current it will absorb from the power supply, then we will simply ramp up the power supply voltage and measure the extra current absorbed as the voltage increases.

For example, the red line shows that when the battery was 50% full at 13.2V the charge current was 35A and at 14.8V the charge

current was 160A, an improvement off about 457%. However, the black line on the graph which was taken when the battery was about 70-75% full shows that, at 13.2V, the current was about 1A (showing that, at 13.2V, the battery was full (in its opinion)). Where, as at 14.8V we were still putting in about 60A, a charge improvement of 6000% (rather an improvement).

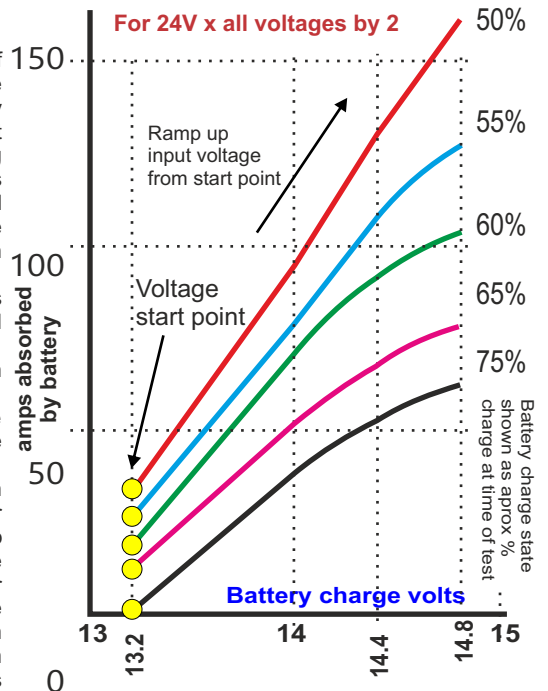
Why the specific voltages?: The voltages chosen are real voltages which one would expect to see in real life.

13.2V: this voltage appears in 2 main circumstances.

a) If you use a split charge diode then one would expect this sort of voltage at the battery.

b) Most alternators now have a built in temperature compensator on their regulator. When the engine room heats up (especially on a vehicle) then the assumption made by the alternator manufacturers is that the battery should be full. So, as the warm air in the engine room is pulled past the regulator, the voltage from the alternator is reduced, the end result is we have seen standard vehicle alternators start off at 14V and drop to 13.2V in vehicles (with the bonnet down) after about 20 minutes. This is okay for the starter battery but will ensure your secondary batteries never charged (as per the graph).

For 24V x all voltages by 2



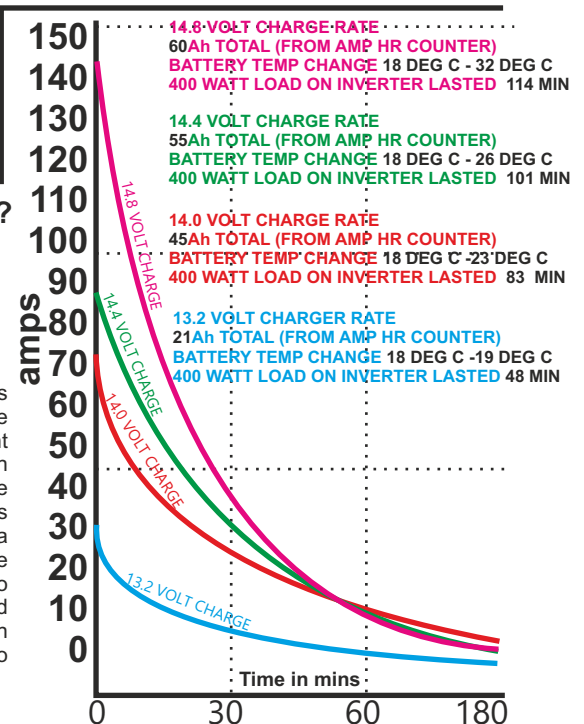
How much extra power is actually absorbed into the battery ?

Having established the dramatic charge improvement which a battery can achieve with the increase in voltage, the many sceptics amongst us will now say 'the battery will charge faster,' but you will gas the battery profusely, you will over heat it and boil it, and all the extra current going into it is not being stored, it is simply being gassed off. Therefore the apparent fast charge is a waste of time. All you have done is wreck the battery. These all appear valid points yet are all prolific rumours. Now lets see if they are true or simply the old wives tales.

Part 2: will this fast charge rate cause problems? With test 2 we take 4 x 100A identical lead acid batteries, as per the above test. We connect all 4 together and discharge them to the same level. Then we will charge one at a time (using a 200A regulated power supply) and over a 1.5 hr period and see how much charge in the form of A are absorbed into the battery and using an Ah counter we can measure the actual Ah which have passed into the battery. After the battery has completed its charge cycle at the allocated voltage we will

then see if the A are actually in the battery as storage A. We do this by discharging the battery through an inverter with a 400 watt light bulb load and time how long each battery can run the load after it has completed its charge cycle. If the Ah counter shows more amps going into the battery and the load runs for a longer period of time, then the amps must have been stored in the battery. We will also measure the battery temperature before and after the charge run to see if the battery is in danger (50 deg C is when a battery starts to have problems) of over heating and boiling.

For 24V x all voltages by 2



Answers to the questions based on actual facts:

1) **Will the fast charge rate also put more into my batteries?** One can clearly see that on the 13.3V charge only 21Ah were put into the battery as opposed to 60Ah with the 14.8V charger. An improvement of about 300%.

2) **Did this 300% improvement actually go into the battery or was it simply lost in heat and gas?** The inverter discharge test clearly shows that the 13.2V battery ran the inverter for 48 minutes, where as the 14.8V test ran the inverter for 114 mins, a clear 230% improvement. So yes, the extra A were being stored in the battery, and were consumed by the inverter as this was the only place the inverter could get the power from.

3) **Will the high charge rate boil my batteries?** One can see the rise in the battery temperature at 14.8V was from 18 deg C to 32 deg C, well inside the 50 deg required before there are any problems. Also bare in mind that this test was charging a 100Ah battery at 150A, in real life with 4 x 100Ah batteries you would need a 500A alternator or battery charger to be able to reproduce this test run, so it's unlikely that one would have a charging source that good.

4) **Is it possible to put a lot of power into a battery in 1 hr?** The graph clearly shows that the bulk of the power absorbed by the charger was in the first hour. So obviously, the battery was comfortable with this as the temperature rise was well within the battery's limits.

5) **A 100 amp hr battery gives 100A output?** Simply not true, even with the best charger, at least 40% or 40Ah tends to be of no use in a battery.

6) **Are there any other benefits from this fast charging?** Yes you also de-sulphate the batteries, this dramatically increases the life of the batteries and reduces the running hours of your engine and fuel costs associated with the charging of the batteries. In fact there are no down sides to this process.

Conclusion: Its quite clear that all the fears are old wives tales. Now all you have to do to harness this information is to add a computer program to store the charging curves, allow the software to control the charge of your batteries, and then 'hey presto', welcome to the world of advanced digital charging from Sterling Power Products.

Voltage drop specification		Safety regulations demands any cable directly connected to a battery source must be fused																	
Required Current based at approx 60 deg C 12V		Warning: this is total cable length not distance to product remember to add the pos and neg cable length as total																	
Higher voltage drop Lights, pumps Non Critical equipment	Low voltage drop inverters, chargers Critical equipment	This chart for general reference only, cables sizes vary with ambient temperatures and other aspects Use only multi strand cable not solid core cable.																	
0-6	0-2	5A	10A	15A	20A	25A	30A	40A	50A	60A	70A	80A	90A	100A	120A	150A	200A	300A	400A
6-9	2-3																		
9-15	3-4.5																		
15- 19	4.5- 6																		
19-24	6-7.5																		
24-30	7.5-9																		
30-40	9-12																		
40-51	12-15																		
51-61	15-18																		
	18-21																		
	21-24																		
	24-27																		
	27-30																		
	30-33																		
	33-37																		
	37-40																		

Cable length meters

AWG American Wire Gauge	Copper diameter mm	Copper cross sectional mm sq	AWG American Wire Gauge	Copper diameter mm	Copper cross sectional mm sq	AWG American Wire Gauge	Copper diameter mm	Copper cross sectional mm sq
16	1.29	1.5	8	3.26	10.0	1	7.35	50.00
14	1.63	2.5	6	4.11	16.0	0	8.25	60.00
12	2.05	4.0	4	5.19	25.0	00	9.27	70.00
10	2.59	6.0	2	6.54	35.0	000	10.40	95.00
						0000	11.68	120.00

For unknown cable simply measure **copper conduit** diameter and equate to the above chart. do not measure the cable insulation diameter. The mm sq figure is rounded up for Euro cables.



Follow us

Sterling Power Products LTD, UK

Unit 8
Wassage way
Hampton Lovett Ind Est
Droitwich
WR9 0NX
England
Tel (44) 01905771771
Fax (44) 01905779434
e-mail:
charles@sterling-power.com

www.sterling-power.com

Sterling Power USA LLC

406 Harold L. Dow Hwy.
Eliot, ME. 03903
USA
Tel 207-226-3500
Fax 207-226-3449
e-mail:
info@sterling-power-usa.com

www.sterling-power-usa.com